Food Manufacture

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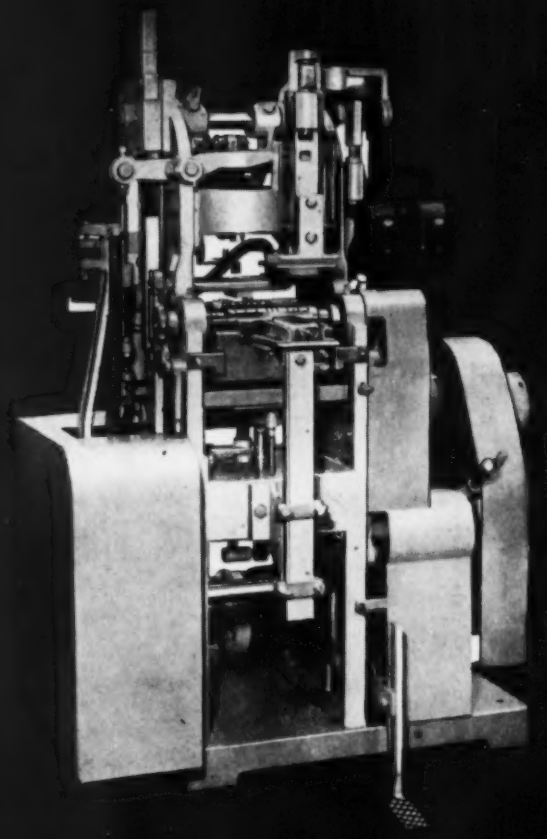

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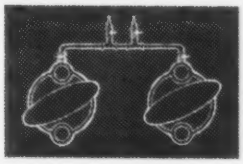

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Continuous *vacuum can filler*.
Continuous *vacuum sausage linker*.

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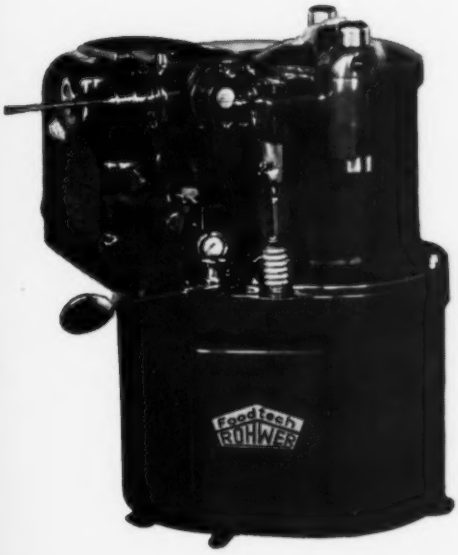

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BCH

Mrs Morgan might be right...

The Glass Container-acceptance Testing Service will find out

The frustrating, nerve racking, thing about developing a new container is that when you have used all the marketing experience, all the know-how, the best brains, there still remains an element of chance. You never can be sure about a design until it has been submitted to the criticism, the approval or disapproval of Britain's 37 million packaging experts – the Mrs. Morgans, the consumers. You may have guessed right. You may have guessed wrong. Not far wrong maybe – just wrong enough to make all the difference. The maddening thing is that if you ever do discover what the Mrs. Morgans didn't like, it probably turns out to have been some footling thing that shouldn't logically have made any difference. That's the trick – consumers don't have to be logical – they don't have to be consistent, they don't even *have* to be consumers if they don't like your container.

It is to remove some of this guesswork (no matter how inspired) from container development, that Britain's Glass Manufacturers have set up the Container-acceptance Testing Service. This provides Packers with facilities to test consumer reaction to new designs *before* they go into mass production. They can be tested in any or all of the following four progressive stages.

1 Design Preference Testing. Any new design can be tested on a consumer panel of 400 households. Their preferences will be analysed and presented to the Packer as a report and recommendation.

2 Container in Use Testing. The new container and its product can be tested in actual use in the home. The panel's experience of the new pack will be recorded, analysed and furnished as a report.

3 Shelf Testing. The sales appeal of a new container can be tested under real store conditions, on the shelves of self-service or other stores. The speed and volume of off-take will be audited and analysed by type of store and locality. The new pack may be tested either alone or against any alternative.

4 Area Test Marketing. It was felt that facilities to convert shelf testing into a test marketing operation would be welcomed by some Packers. To make this possible an expertly staffed marketing service has been established which will plan, organise and, if desired, execute test marketing campaigns in their entirety for Packers launching new glass packed products.

Free Service. Because the Glass Manufacturers believe that these services should be used as widely as possible, all the facilities under headings 1, 2 and 3 are offered *free* as a service to the packing industry. The only cost to the Packer under these headings will be in the supply of goods, containers and such items as labels and transport. In the case of Area Test Marketing schemes however, a nominal charge will be made for planning the operation.

Security. Where any of these tests are carried out on new products, the whole operation can be executed with absolute security. Packers can have complete anonymity by employing one of the several brand names that have been registered especially for this purpose.

If you would care to have further details of this service, please do not hesitate to ask, irrespective of whether your interest is immediate or not. Your Glass Container Manufacturer will be happy to discuss your problem and to help you in any way. Details of this scheme have been published as a booklet, copies of which are available on request from your Glass Manufacturer or from the Federation.

SEE HOW GOOD THINGS ARE IN GLASS

THIS IS AN ADVERTISEMENT OF THE GLASS MANUFACTURERS' FEDERATION
19 PORTLAND PLACE · LONDON W1
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Weston's are
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8v/F/3

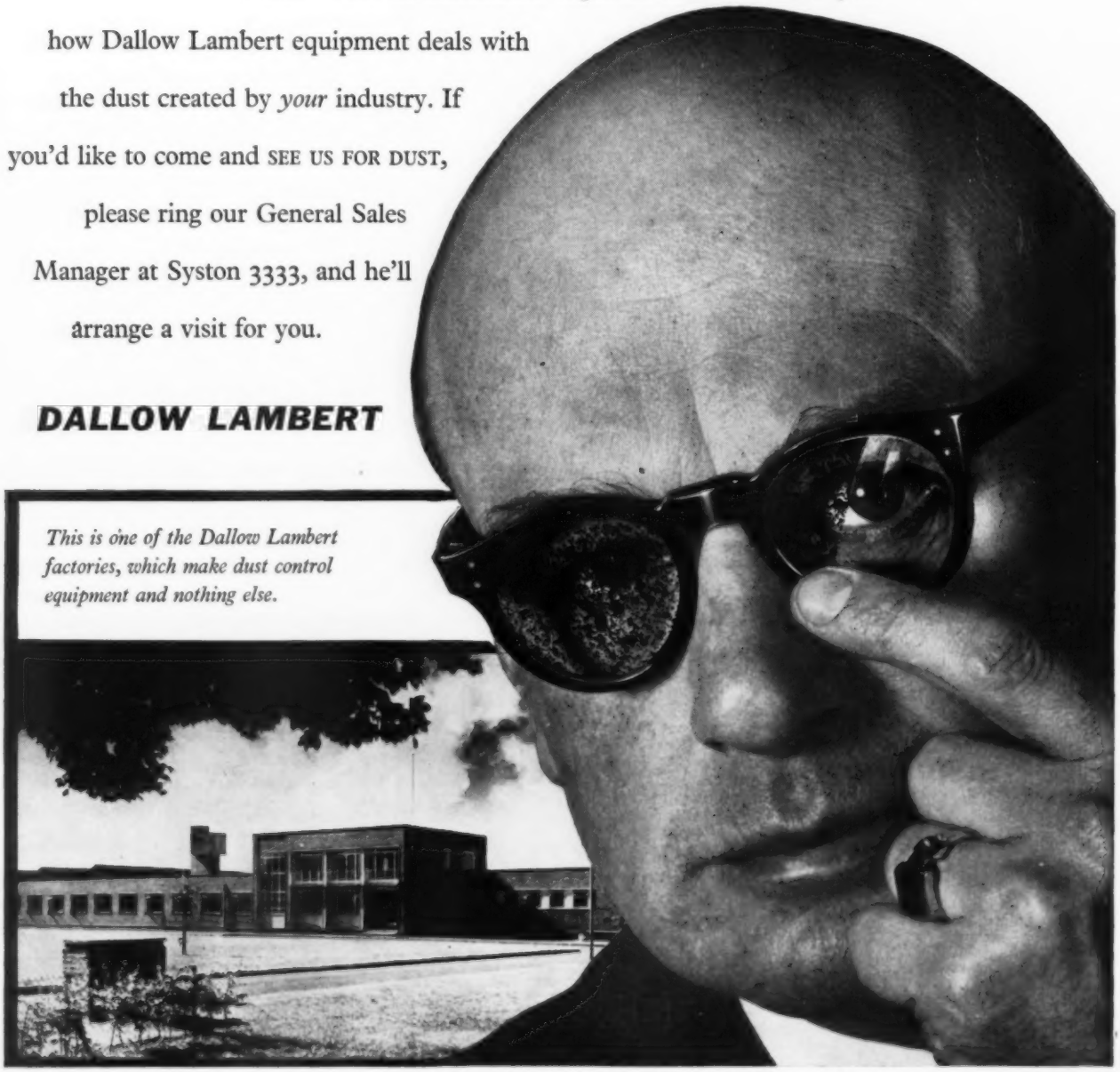
an invitation to

see us for dust

If you're interested in dust control, we're pretty sure you'll find it worthwhile spending an hour or two with us at Leicester.

There in our demonstration department we can show you how Dallow Lambert equipment deals with the dust created by *your* industry. If you'd like to come and SEE US FOR DUST, please ring our General Sales Manager at Syston 3333, and he'll arrange a visit for you.

DALLOW LAMBERT



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CRC 93

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MIXER CONTROL DESK. The operator simply presses one button. The mixing cycle is then automatic and the completion of each operation is indicated on the desk.

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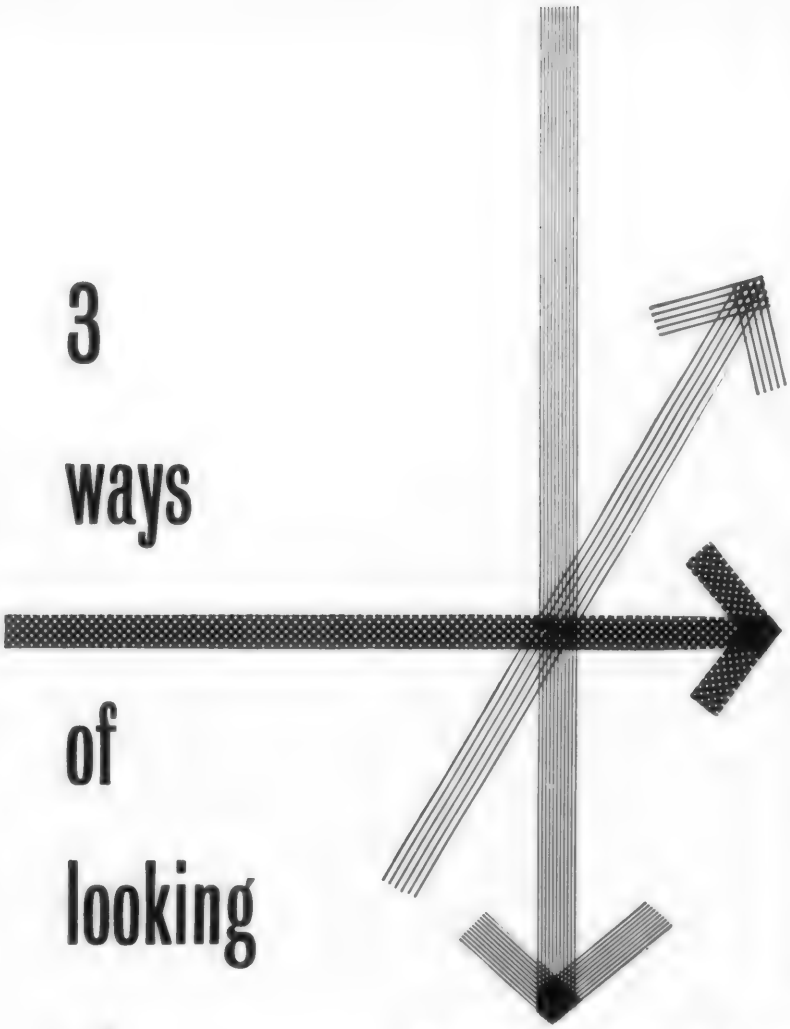
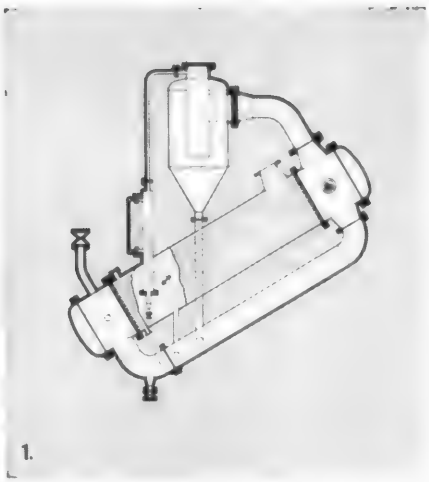
Westwood Works, Peterborough

BP 8828

3 ways of looking at Evaporators





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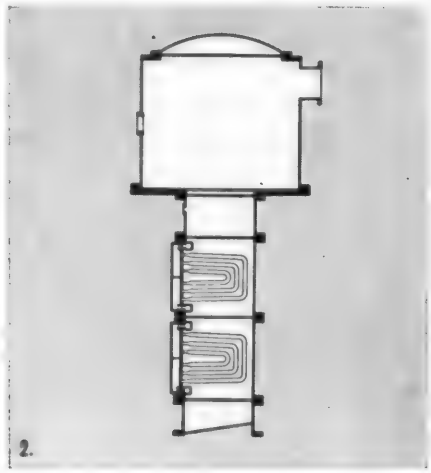

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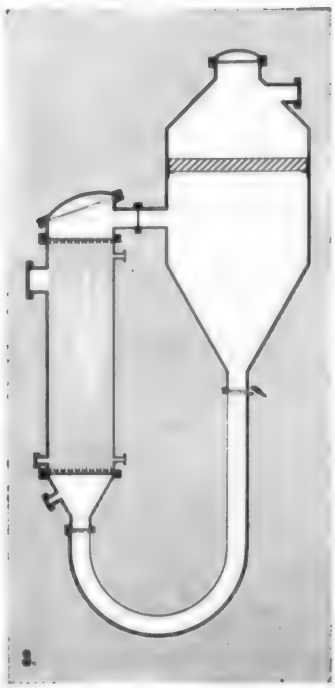

3.

1 *Inclined natural circulation evaporator.*

2 *Natural circulation evaporator with removable horizontal tube nests.*

3 *Vertical natural circulation evaporator*

Chemical processes, food processes, are individual processes. They all have distinctive features, and a universal evaporator is not practicable. The Aiton Organisation has a range of proved designs for all chemical and food liquor concentration processes. Reaction vessels, heat exchangers and mixers are also made, allowing the preparation of comprehensive tenders.

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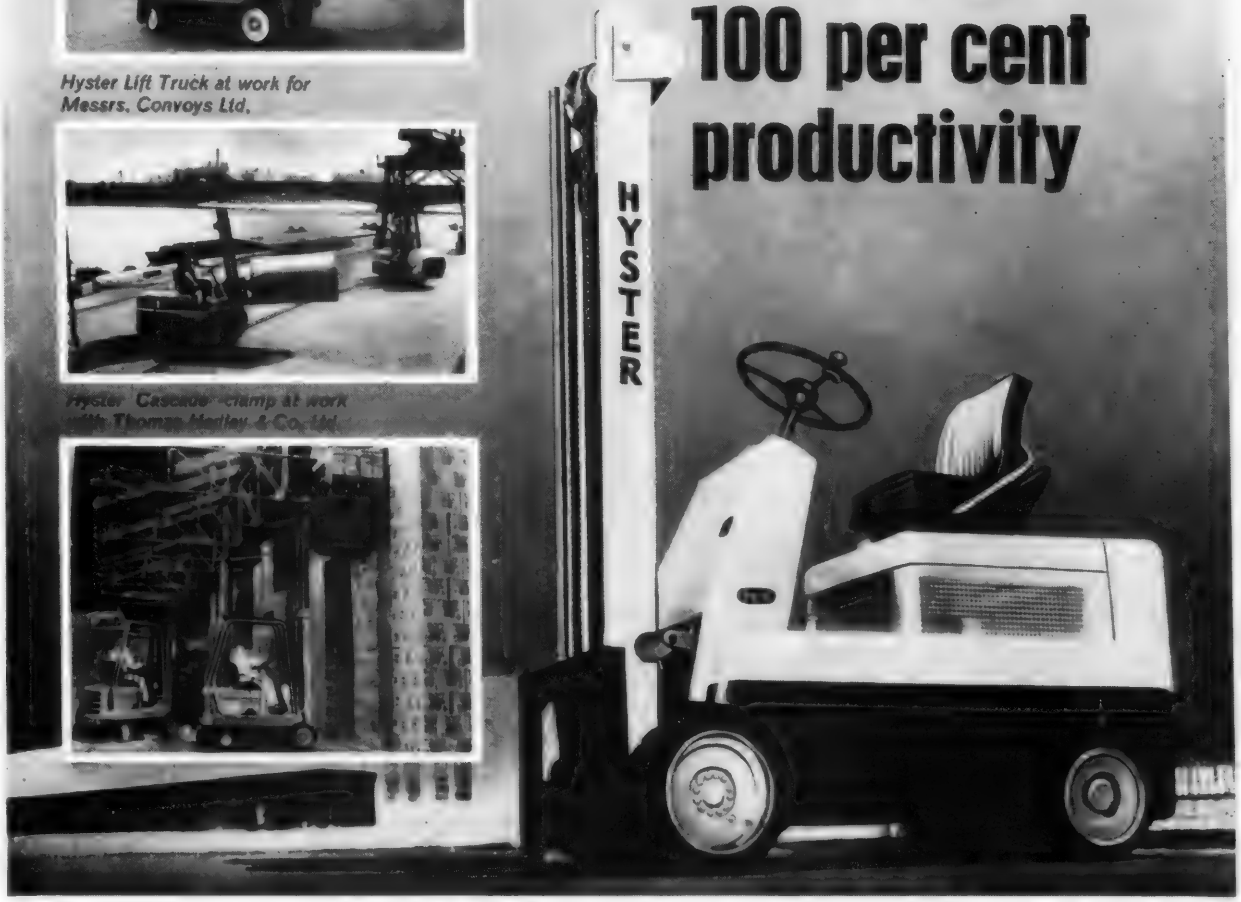

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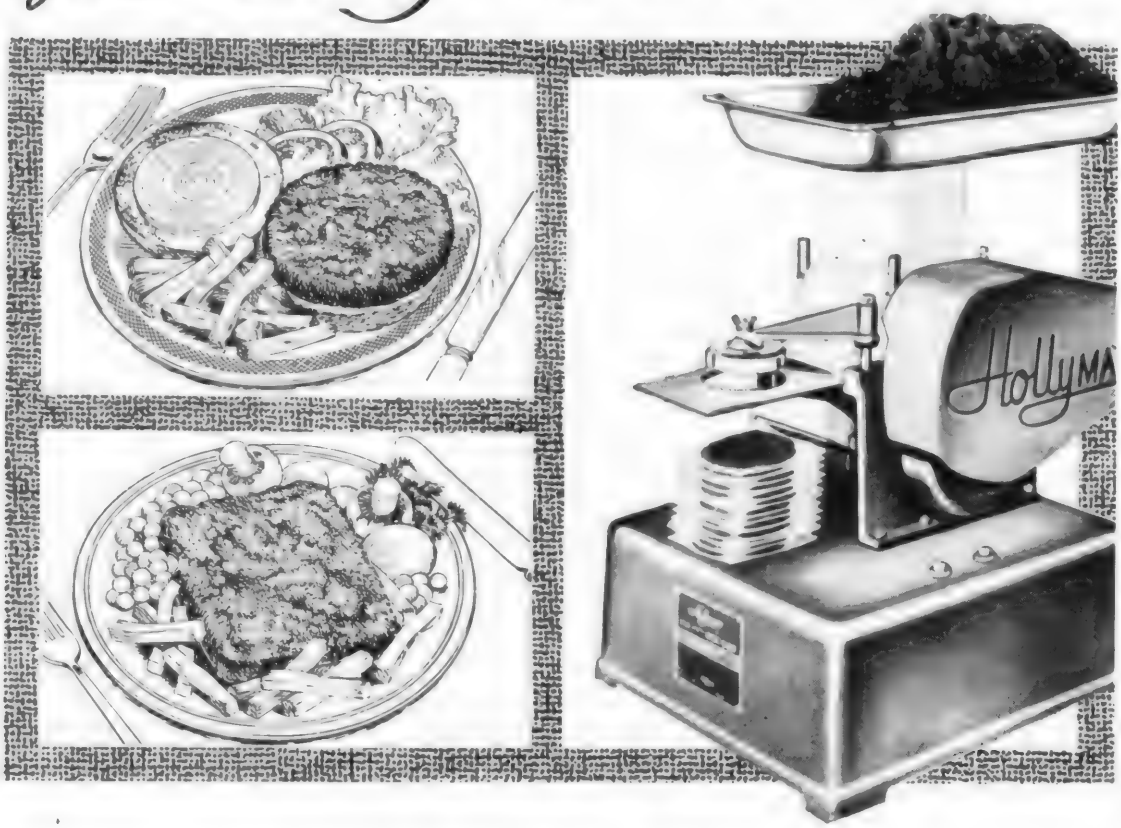

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QUICKLY, EASILY & ECONOMICALLY

The versatile Hollymatic Patty Making Machine cuts down overhead costs . . . fast ! It will produce *up to* 1,600 *patties or hamburgers an hour ; identical size ; identical thickness ; identical shape ; and stack them automatically on paper.* The Hollymatic is even more efficient than a trained team of assistants and it requires only a minimum of supervision for a maximum output. Hollymatic makes meat products more saleable, more customer appealing. Write or 'phone us for a demonstration.

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if you want

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CUTTERS THAT CUT

FILLERS THAT FILL

LINKERS THAT LINK

you must see

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it has a heatsealable lid and either a paper or wax protective inner liner

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a wide range of products from powders and crystals to syrups can be packed in . . .

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by Mardons

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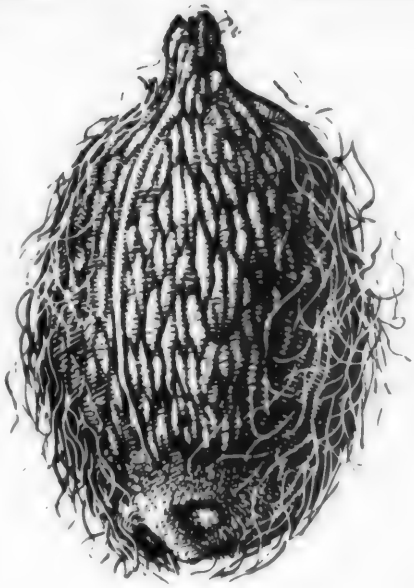

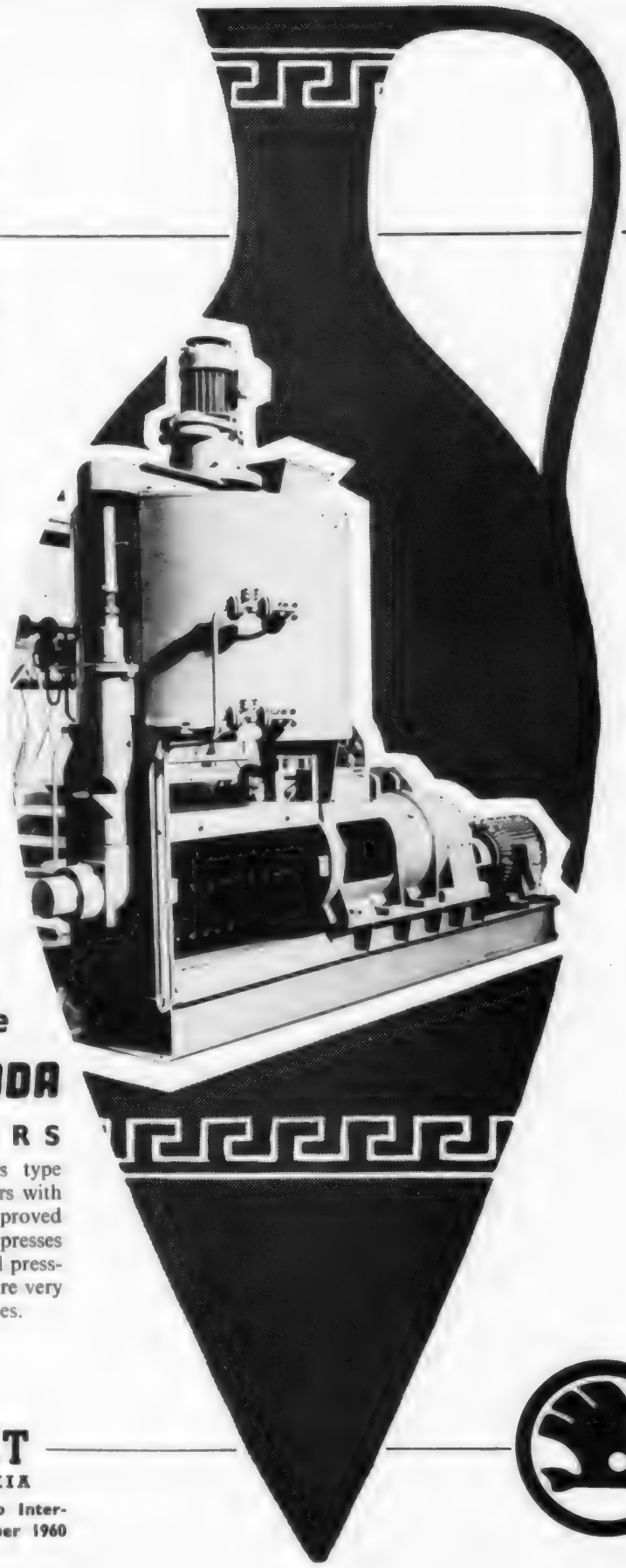

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STERILISER

manufactured under licence by

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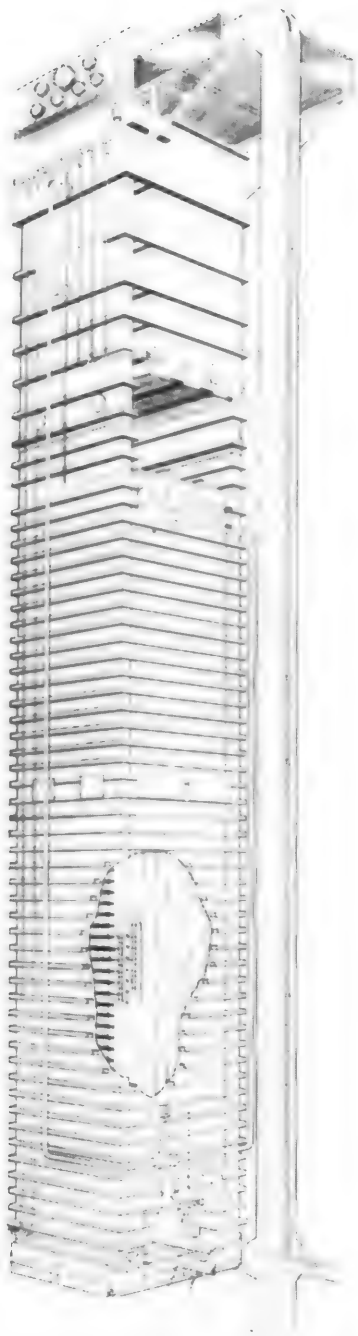

These are its advantages:

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* **FLEXIBILITY** — Variable sterilisation temperature and time to suit each product.

* **SECURITY** — Throughout sterilisation and cooling, unit containers are totally enclosed in perforated steel carrier tubes. They cannot escape.

* **ECONOMY** — Contra-flow principle ensures great economy in steam and water. — Floor space occupied seldom exceeds 35 sq. ft. — Fully automatic operation and mechanical reliability allow remarkable economy in manpower.

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* **EASE OF INSTALLATION** — The Carvallo Steriliser may be installed at floor level or in a pit according to circumstances.

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A55 1

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BEER IN CANS... another new use for tinplate

Tinplate is changing the traditionally conservative habits of beer-drinkers. Already in Britain leading brewers are packing no fewer than one hundred and eighteen brands of beer in cans.

Research and development by The Steel Company of Wales have helped to make possible this further example of tinplate's increasing versatility. In addition to the special type of tinplate required for canning beer, The Steel Company of Wales produces a wide variety of grades and qualities to suit many specialized applications.

We make a great deal of Britain's tinplate, and we are constantly learning something new about it. There are several interesting recent developments. Why not write to us?

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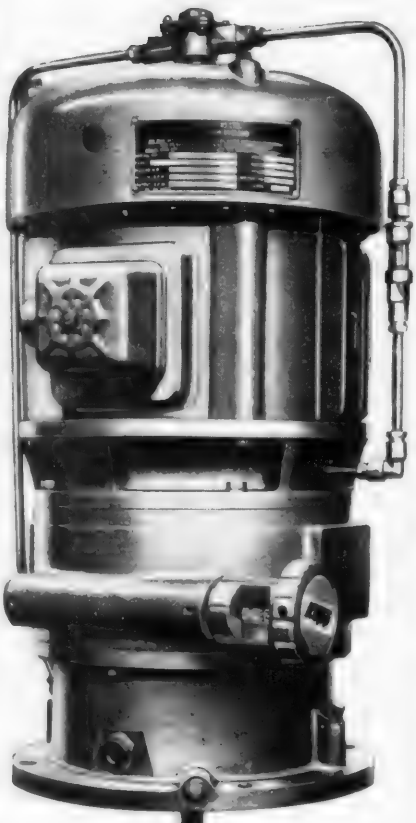
THE STEEL COMPANY OF WALES LIMITED

Carmarthen Road, Swansea, Glamorgan Telephone : Swansea 51571 Telegrams : Welshplate, Swansea



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UP TO 12" HIGH AND 7¼" DIAMETER.

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- **SPEEDY HEIGHT ADJUSTMENT.** *One* control gives instant accurate setting for cans up to 12" high.
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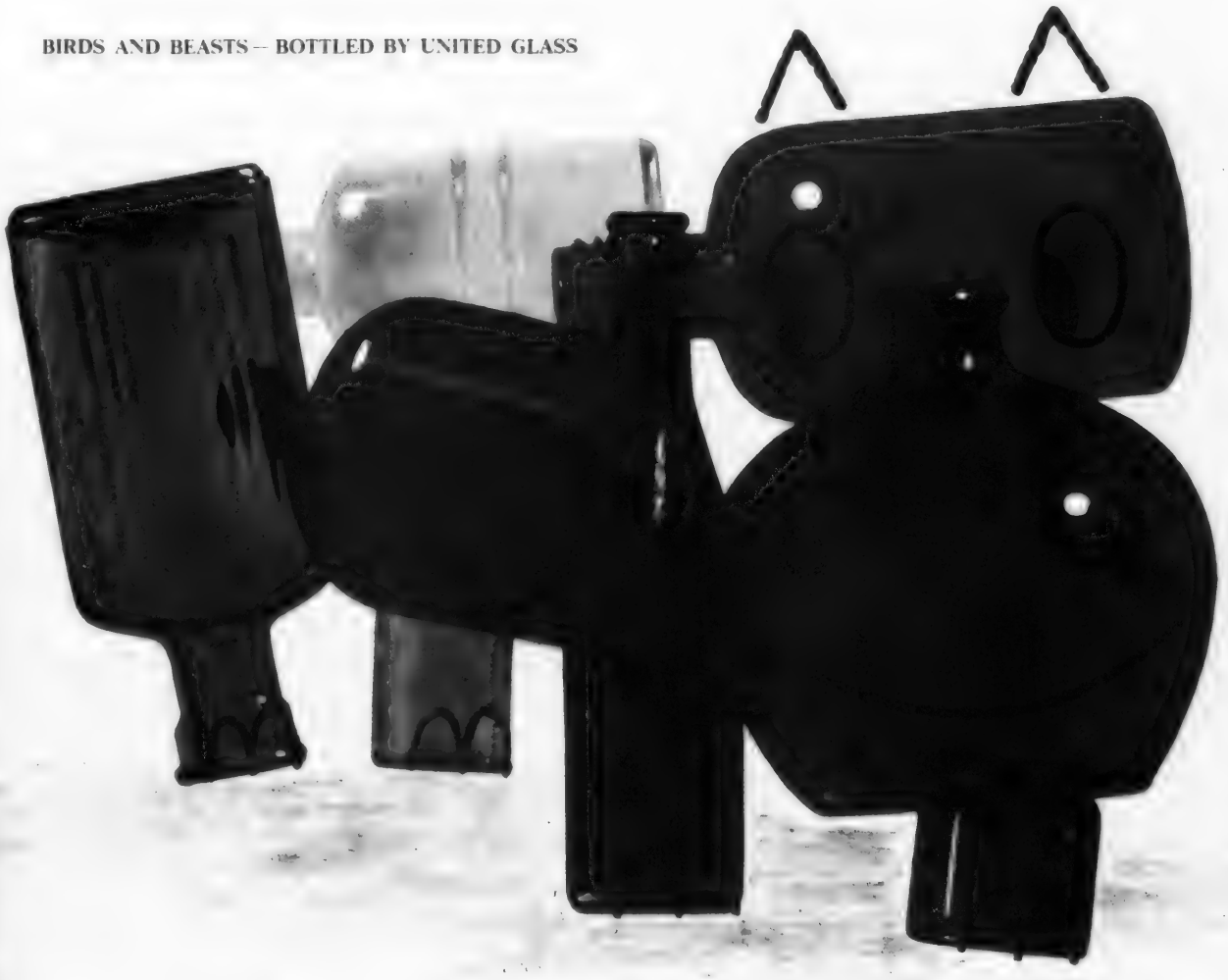

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- The right type of container for every kind of product.

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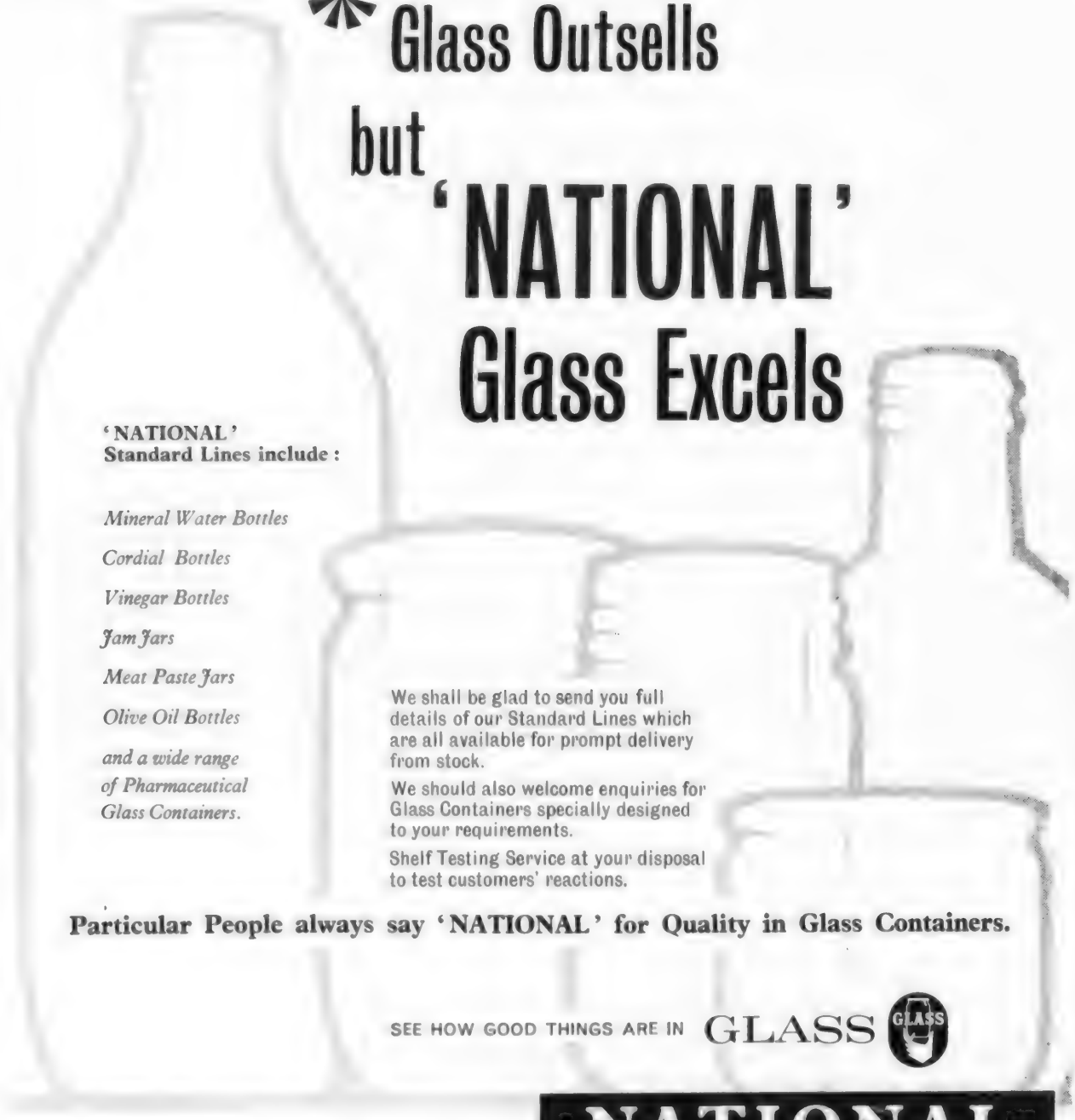
Divisions of INTERNATIONAL FLAVORS & FRAGRANCES INC.

* Glass Outsells but 'NATIONAL' Glass Excels



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and a wide range of Pharmaceutical Glass Containers.

We shall be glad to send you full details of our Standard Lines which are all available for prompt delivery from stock.

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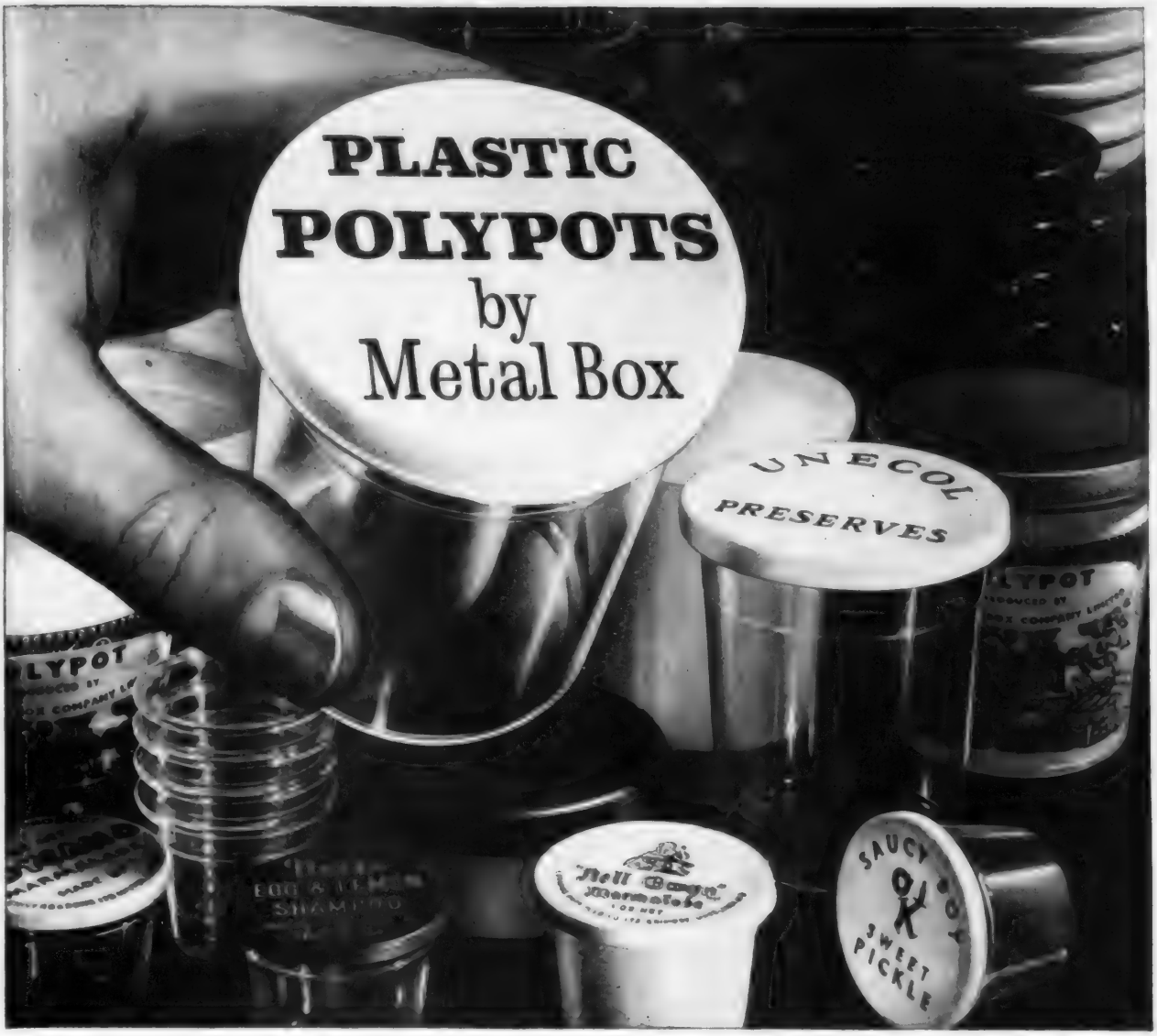
Regd Trade Mark



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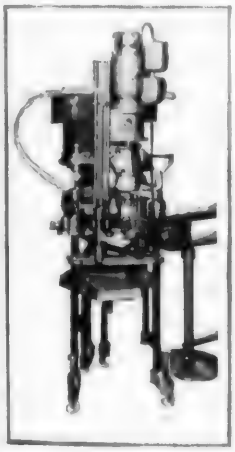

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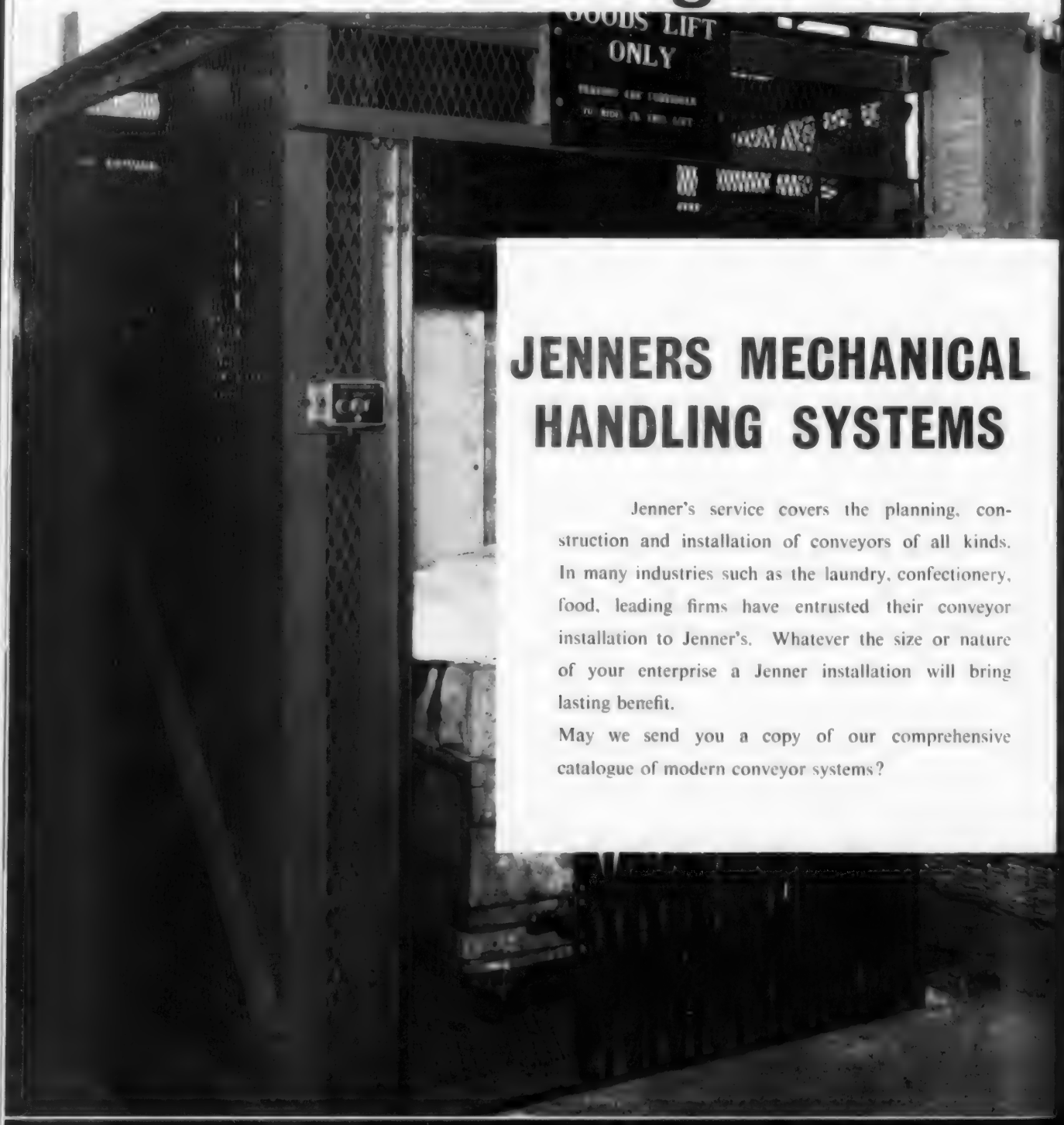

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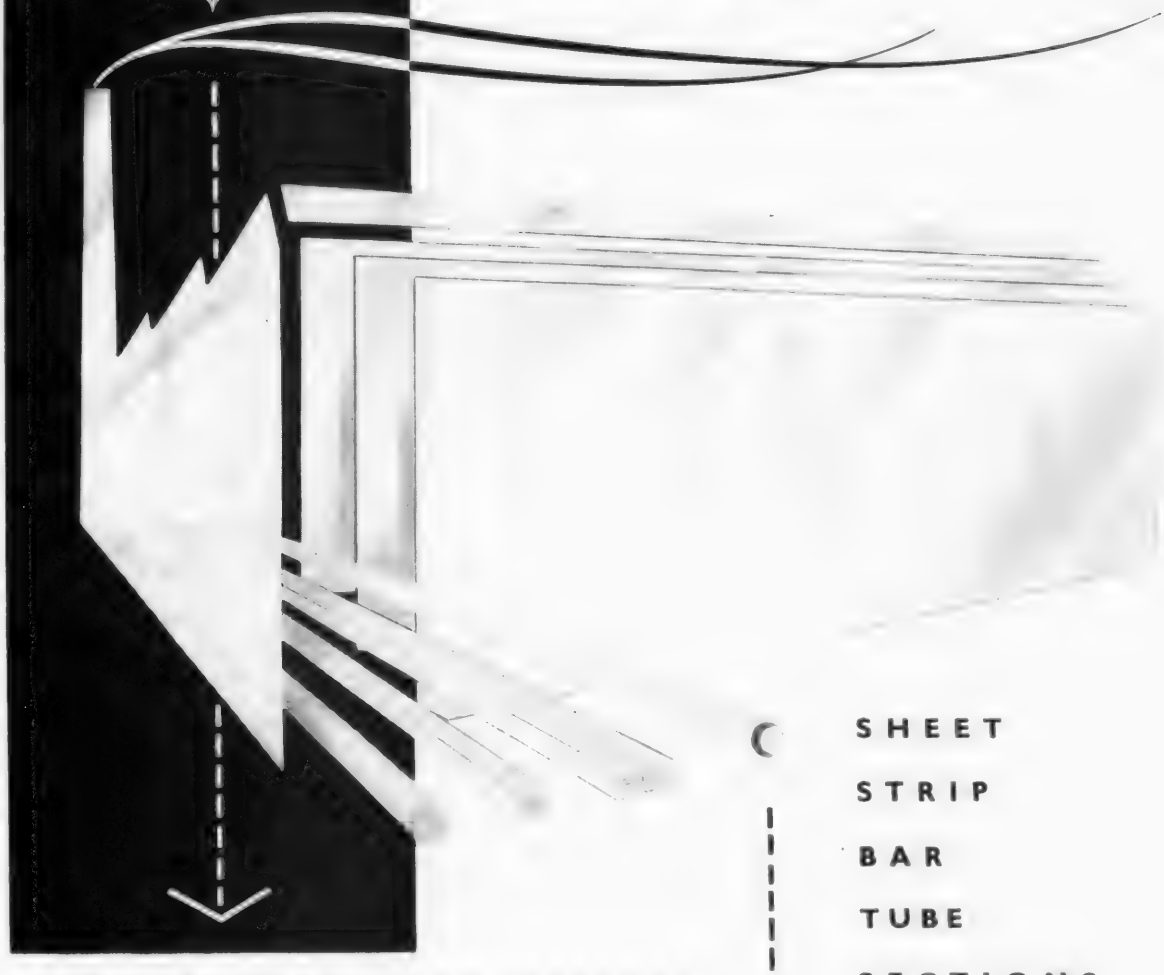

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Complies with the requirements of the Food and Drugs Act 1955, and the Foods and Drugs (Scotland) Act 1956.
SPECIFICATION: CRYSTALLISING POINT NOT LESS THAN 69.4°C
LEAD NOT MORE THAN 10 PPM
ARSENIC NOT MORE THAN 2 PPM
I.C.I. (Heavy Organic Chemicals) Limited, Billingham England.

'TOPANOL' BHT – a new food antioxidant

The *Antioxidant in Food Regulations, 1958*, permit the use of butylated hydroxytoluene in a variety of foods: 'Topanol' BHT is prepared with great care specially for this purpose.

'Topanol' BHT conforms with the requirements of the *Food Hygiene Regulations, 1955*, and other relevant legislation under the *Food and Drugs Act, 1955*.

'Topanol' BHT meets the following specification:—

Crystallising point	—	*not less than* 69.4°C.
Lead	—	*not more than* 10 p.p.m.
Arsenic	—	*not more than* 2 p.p.m.

Animal and vegetable oils and fats, and baked and fried foods containing these, are protected from rancidity at concentrations as low as 0.01% by weight—cooking temperatures do not destroy activity.

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The appetising appearance of food packs can be maintained by the use of plastic film wrappings (e.g. polythene) colour-stabilised and protected against embrittlement.

Natural and synthetic oil-soluble vitamins (e.g. in fish liver oils) and citrus and other essential oils are also the better for 'Topanol' BHT.

A PRODUCT OF

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Manufacturers and Converters of Transparent Cellulose Film

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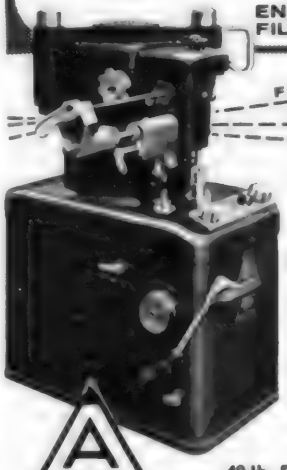
NO WASTAGE



At last sausage making is fully automatic. Just press a button on the A.B.R. filler linker and you can produce up to 200 sausages a minute! There's absolutely no wastage or contamination. No oil can reach the meat and there are no crevices for the meat to pass through. The machine is adjustable to suit any type of casing or sausage meat. An automatic holding device can be supplied for synthetic casings.

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Ideal for the small manufacturer. Takes hard deep-cooled or soft sausage mixes. Knee-action lever for easy control. Single- or 3-phase motor.

A BR *Automatic* **FILLER LINKER**

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Please send full details of the A.B.R. AUTOMATIC FILLER LINKER without obligation to:

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Please tick size req'd. 155lb. ☐ 110lb. ☐ 40lb. ☐ F.M.

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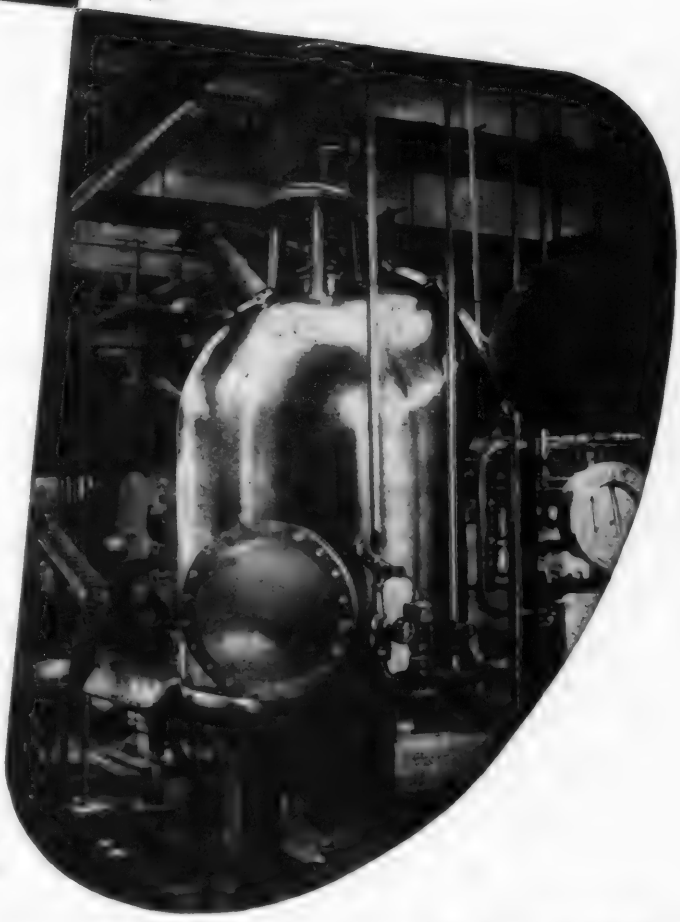

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Jackson packaging advisory service

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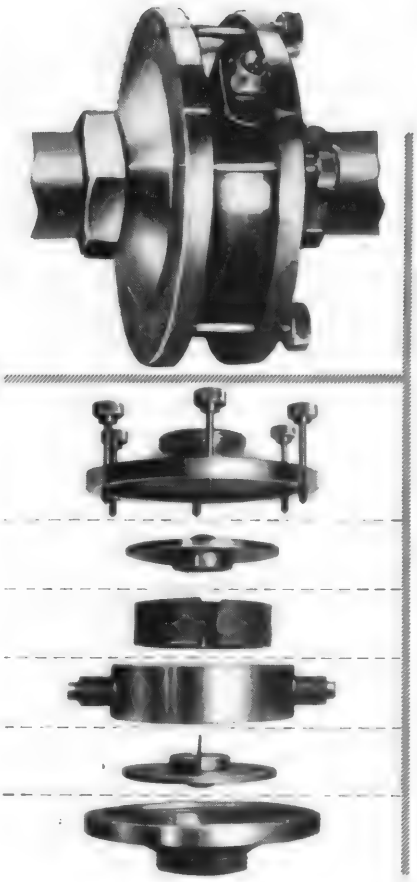

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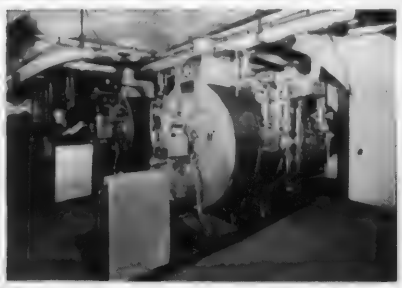

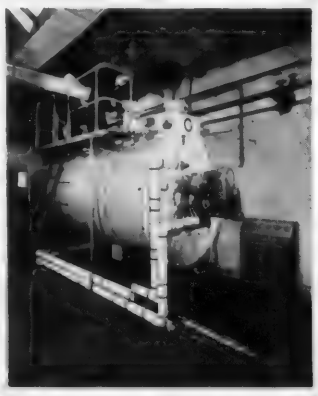

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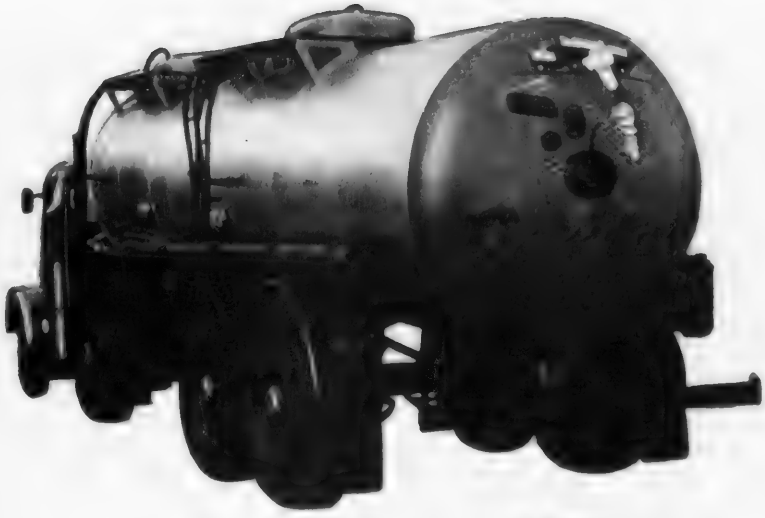

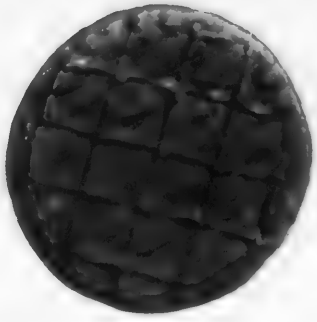

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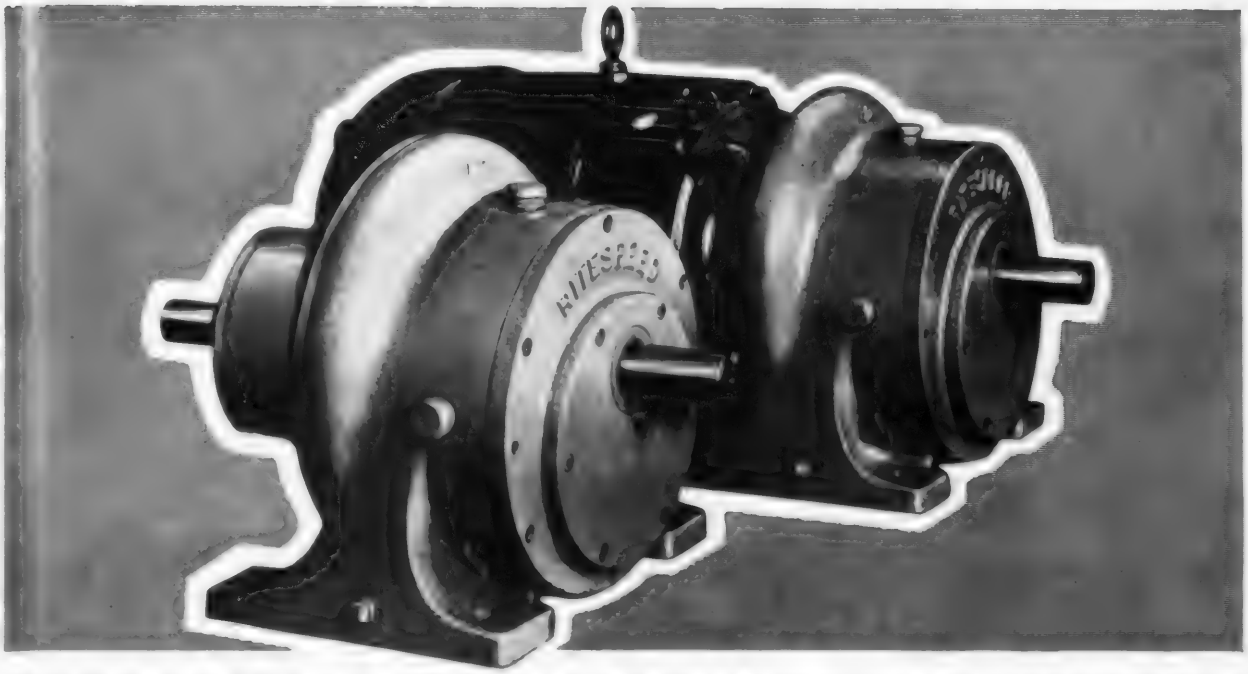

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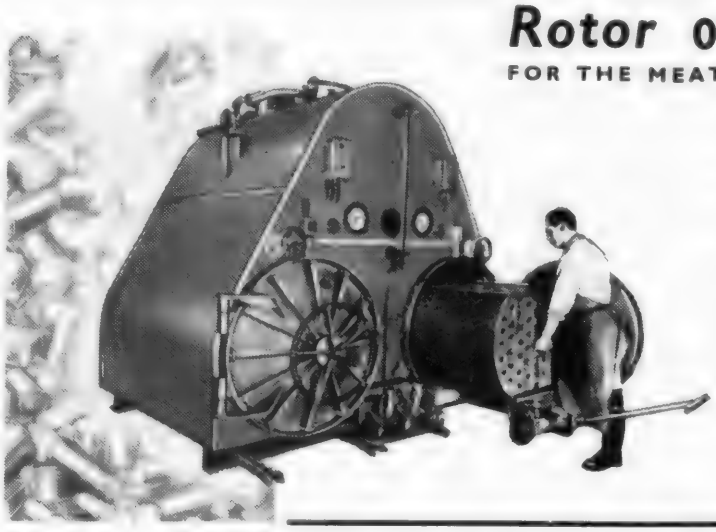

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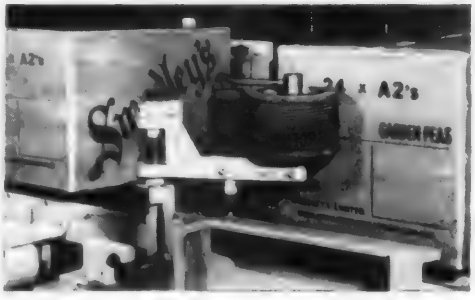

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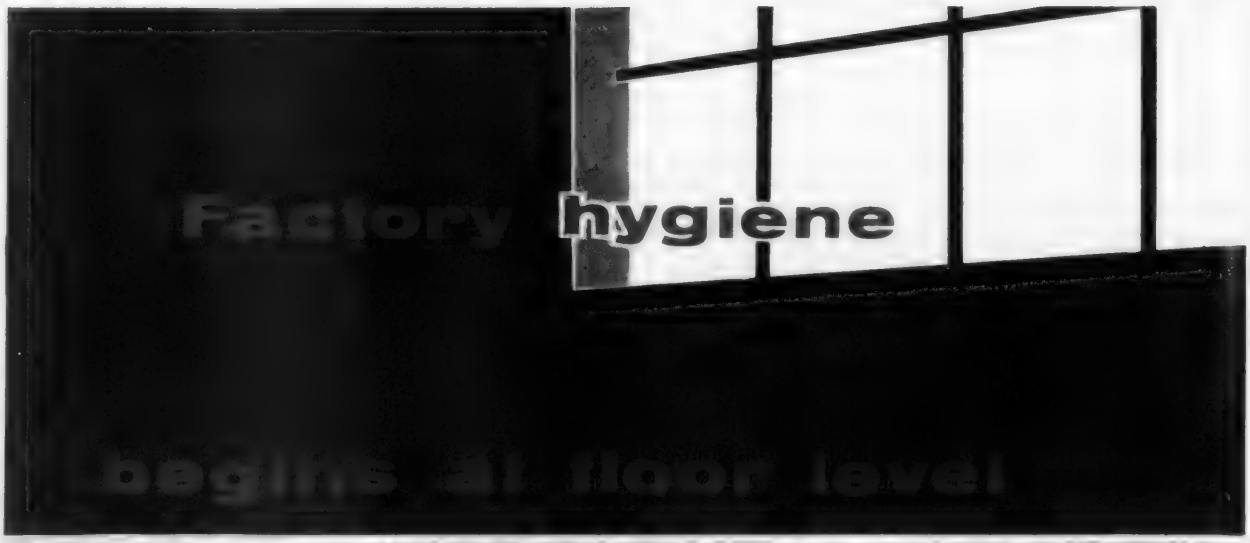

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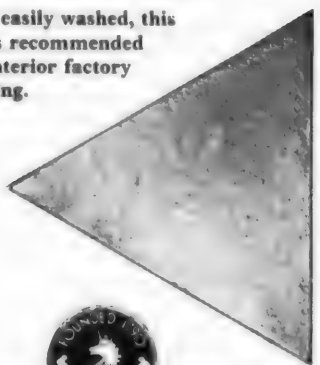

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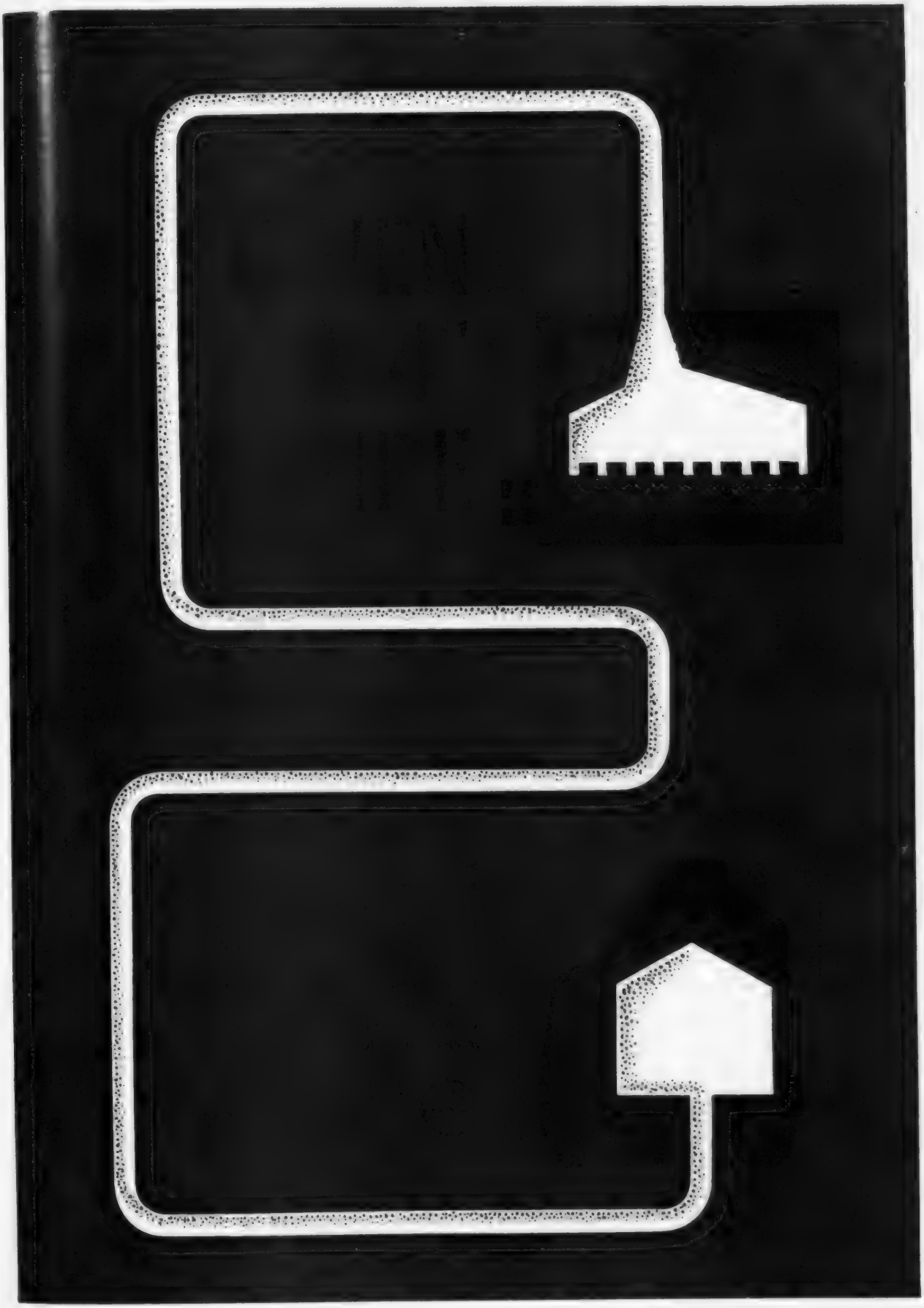

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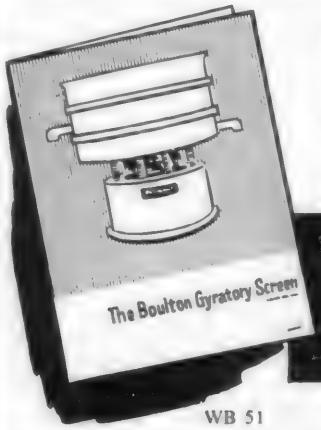

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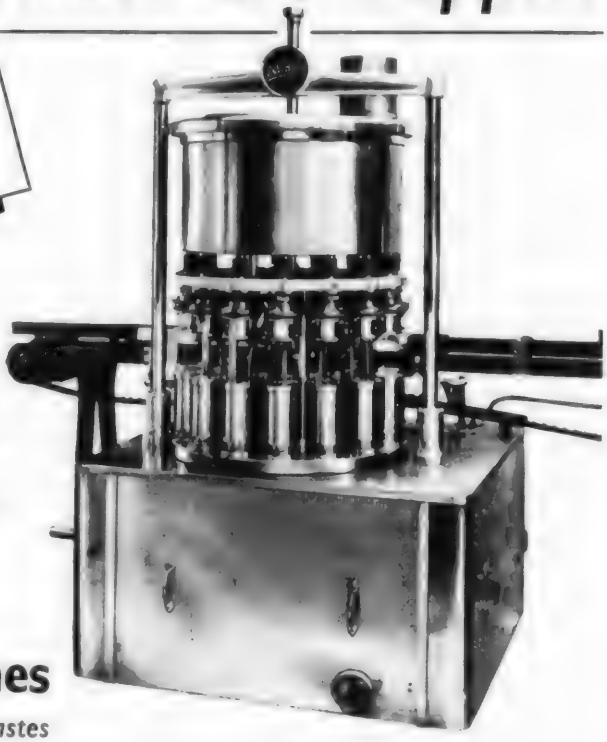

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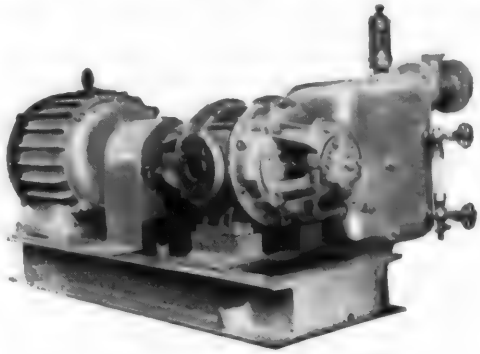

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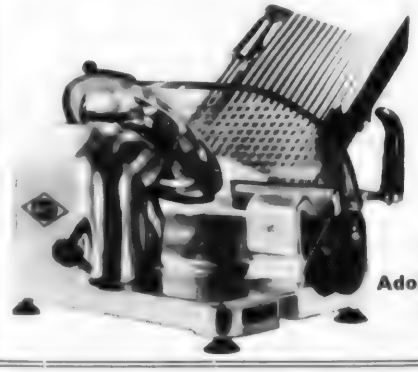

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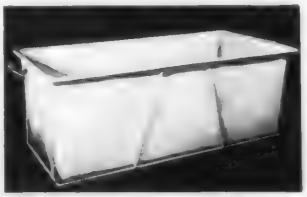
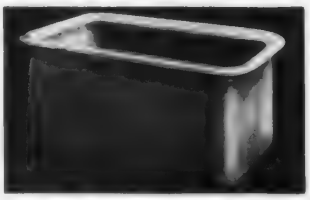
cut handling costs with WCB polythene





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Trays
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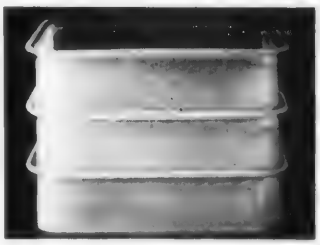

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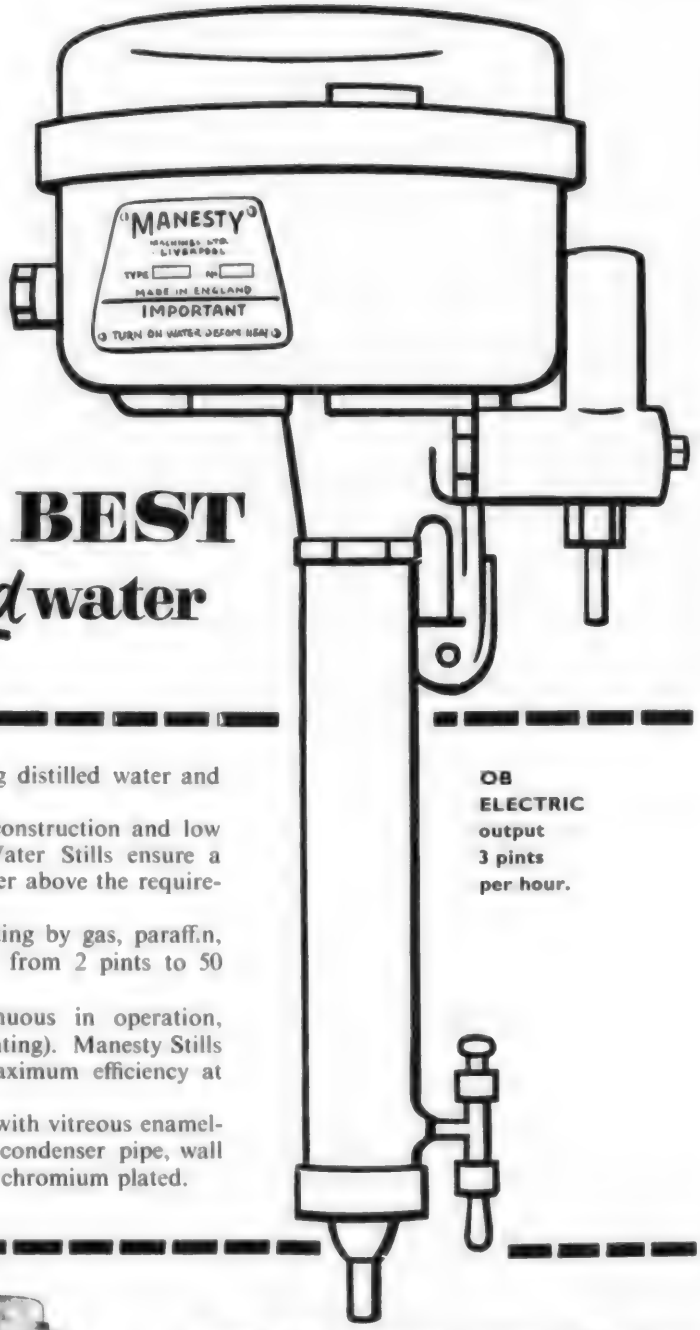

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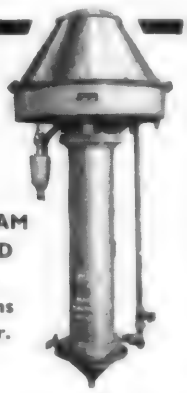

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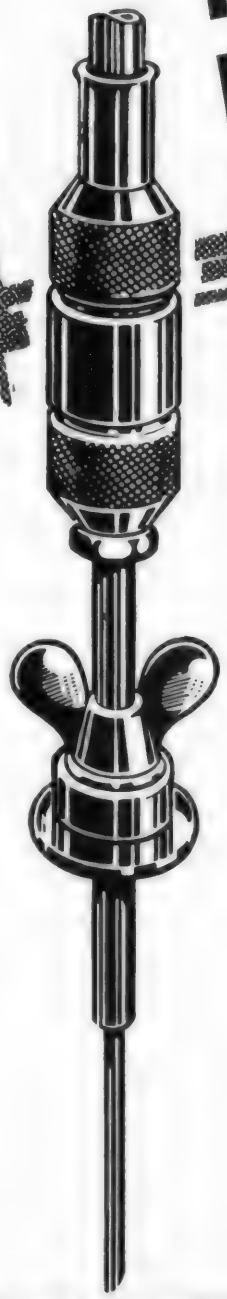

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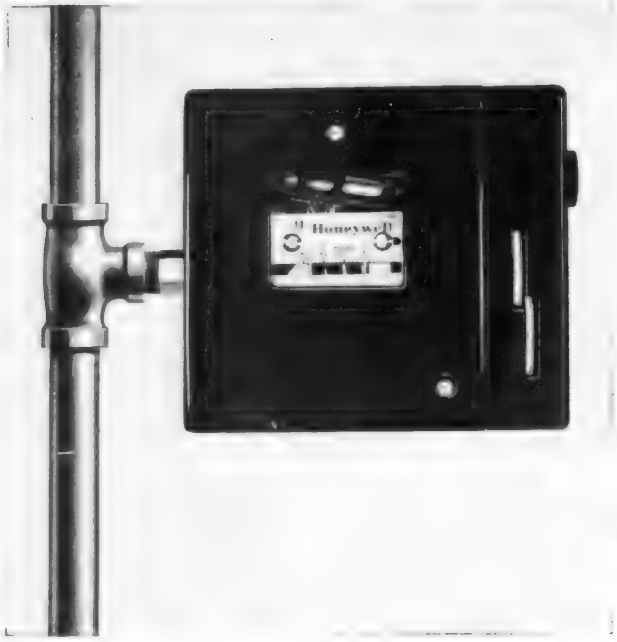

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Food Manufacture

Volume XXXV. Number 8 Editor: Anthony Woollen, B.Sc., A.R.C.S., A.R.I.C. August 1, 1960

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Food Manufacture

Vol. XXXV, No. 8 August 1, 1960

An independent protection committee?

THE setting up of a committee, independent of Government administration, analogous to the Food Protection Committee in the U.S.A., was suggested by Professor A. C. Frazer in his presidential address to the British Food Manufacturing Industries Research Association. There are, it is true, a number of committees directly and indirectly concerned with the increasing problems brought about by the growing use of food additives in greater and greater number, such as the Food Standards Committee, but none of these have direct call on the laboratory facilities of the dozen or more Institutes and University departments which are doing work on food additives. This is a grave disadvantage, and as these various laboratories have little reserve capacity to cope with any increased demand, difficulties might arise if foresight is not used now to anticipate the demand several years hence.

In other countries, the U.S.A. particularly, much greater pressure is being brought to bear on those directly concerned with food additives to ensure their adequate testing. While there is no need to fear that in this country we are lagging dangerously behind in this matter, yet the fact that foodstuffs exported from this country have to satisfy the possibly more stringent regulations of the importing countries means that we have to take note of regulations enforced in other countries. The fact remains that our administrative machinery is at present very inadequate to deal with the additive problem.

Professor Frazer said that in his view one of the functions of the proposed biological testing station, which he regarded as essential, should be to act as a centre and clearing house for information, to which those concerned could turn not only for information but also for advice regarding their additive problems and testing programmes. The testing of a food additive is a long and expensive business, lasting a minimum of two or three years. It is obvious that the testing station will not be able to test every sundry product which manufacturers may offer, and testing must be restricted to those substances which stand a good chance of being proved effective and safe. It is essential that the planning of tests should be discussed with the competent authorities at an early stage, and guidance is necessary as to what tests should be done.

In spite of all the basic research which has been done, we are still amazingly ignorant of the nutritive changes which occur in food during processing, and of the possible effect of food additives on nutritive value. Much more basic research work is needed into the biological action of food. Many early endeavours in the field of food processing foundered because the sponsors were ignorant of basic principles; basic principles must be established before we can get very far in the safe use of increasingly complex additives.

No frozen foods in Italy

CHIEF impressions of FOOD MANUFACTURE's recent visit to northern Italy in company with the S.C.I. Food Group's overseas tour are that the Italians eat far fewer processed foods than we do, and that frozen foods are practically non-existent. Principal reason for the latter seems to be that fresh fruit and vegetables are available nearly all the year round.

The inhabitants of the Lombardy Plain are industrious and hard working, and this, coupled with the natural advantages of the region, make this the most prosperous part of Italy. We visited a number of food factories and research establishments, and were impressed with much of what we saw, particularly in the matter of the cleanliness and quality of the equipment used. Some of the machinery, we were pleased to see, was British.

Among the establishments visited were the Cinzano Co.'s vermouth production plant at San Vittorio d'Alba near Turin (where we saw a very streamlined and highly mechanised bottling plant); the Central Dairy and the Alemagna confectionery, baked goods and ice-cream factory, both in Milan; and the Wamar Biscotti Co. in Turin, makers of biscuits and that particularly Italian creation, panettone, half bread, half cake. Of more agricultural interest were the Œnological Experimental Station and its vineyards at Asti (where we saw a particularly elegant portable spraying machine which imparts an electrostatic charge to the fumigant particles causing them to stick more effectively to the foliage); the pepper-

mint fields of Pinerolo where the stills for distilling the peppermint oil were seen; and the laboratories of the Department of Agricultural Chemistry in Turin. On an academic note, the male members of the party attended a meeting of the Piedmont section of the Italian Chemical Society, which was addressed by Prof. Mario Milone of Turin University on the subject of "Italian legislation and the genuineness of food," and by Mr. T. McLachlan, leader of the British party, whose subject was "Food legislation and its effect on food sophistication."

Unquestionably the visit was a great success; as the party included a number of executives of British firms whose lively discussions with our Italian hosts more than once played havoc with the tight schedule, we cannot doubt that our Italian friends learnt something as well as ourselves.

Less noise, please!

OUR plea in the May issue for less noise in factories (referred to by a contributor in this issue) is echoed in a recent issue of *Occupational Psychology*, journal of the National Institute of Industrial Psychology. The journal describes experiments which showed that workers paid more attention to their work and made fewer mistakes when conditions were quieter. "Noise," says the report, "does produce human error in a real-life situation, even amongst people who are used to it."

Food and water from unusual sources

EFFORTS to increase the available food supplies are leading research workers into what at first sight might seem unlikely and, to the layman, rather repulsive, channels. We learn, for example, that the Herring Industry Board and the National Research Development Corporation are jointly considering building a prototype commercial-scale plant for producing human food from stale herring and animal waste. According to the Board's annual report, development work has been going on for some time on the separation by distillation of herring constituents with the aim of producing high-grade protein.

The most refined idea yet, we learn from our associate journal *Manufacturing Chemist*, comes from the U.S.A. At the national meeting of the American Chemical Society, a biochemist working for General Electric outlined to a somewhat startled audience a scheme for producing drinking water from what he delicately called metabolic wastes. There is no prize for guessing where such a scheme would be needed—the answer is, of course, in a space vehicle. One of the answers to the problem of providing water to travellers in the cramped space-ships of the future may be the recycling and distillation of excreta, converting it into pure water and drinking it, not *ad infinitum* but *ad astra*.

It is claimed that the process runs on vacuum and solar energy. Urine and fæces are distilled by using the vacuum in space and then passed through a high temperature catalytic zone heated by solar energy, where bacteria, odours, and other toxic materials are destroyed. The process is claimed to extract 95% of the water in the wastes and to regenerate it to "impeccable quality." Apparently it is regularly drunk in the G.E. Space Sciences Laboratory. "Laboratory workers will not bother to go across the hall to the water cooler when any of this uniquely produced water is available," commented Mr. Bengson, the biochemist. "It cannot be distinguished from distilled water, but it can be distinguished from ordinary Philadelphia drinking water. It is of higher quality."

The research is going ahead on two fronts. Animals are being fed with regenerated water for long periods to study the possible build-up of toxic materials, and the engineering parameters for the apparatus are being worked out.

Fooling the public

"WE are being fooled by synthetics" ran the headline of a recent article in the *Daily Telegraph*. Its theme was that our palates have become so dimmed with synthetics of all kinds that the general public no longer recognises or even wants the real thing.

There is so much alarmist literature written these days on the subject of food additives and the hoary question of "natural" *v.* "synthetic" foods that responsible newspapers do a disservice to their readers when they publish articles, such as the one quoted, of shallow content and containing a sufficient grain of truth to catch the attention of the thoughtful reader. It is true that our food laws, strict as they are, still leave occasional loopholes for unscrupulous manufacturers to delude the uninformed buyer, but practices of this nature are far fewer today than they used to be. It is not true that, generally speaking, the public is being fooled. One has only to look back over the last century or two to realise that in days gone by fooling the public in food matters was a game played on quite a large scale.

In his recent address to the Turin section of the Italian Chemical Society, Mr. T. McLachlan, chairman of the S.C.I. Food Group and leader of this year's overseas tour, quoted some examples of fooling which before the 1860 Act were rampant, such as the sale of dried extracted tea-leaves as tea, exhausted ginger as ginger, the substitution of roasted grains, acorns, lupin seeds and other substances for

roasted coffee, the widespread watering and skimming of milk, the addition of salt to beer to promote a thirst and, in consequence, increased consumption, and the polishing of rice. Other practices which spring to mind are the sweetening of wine with lead acetate (!) and the colouring of canned peas with copper sulphate. The author of the newspaper article referred to professes himself "terrified"; bygone practices are far more terrifying in the light of modern knowledge.

Weaknesses of the present food regulations, which were pointed out by Mr. McLachlan, are that local authorities find it much more easy to obtain prosecutions and convictions under the hygiene regulations rather than under those concerned with the actual composition of foods, and that food experts have no power over British courts to prevent abuses such as the large-scale manufacture of an "egg powder" consisting simply of a coloured baking powder; the making of this product began in about 1900 and was only stopped by the Ministry of Food during the last war through pressure brought to bear by American exporters of real dried egg powder.

Who do they think we are?

A DROP of vitriol from the pen of Miss Katharine Whitehorn on the subject of Public Relations Officers has provoked some tart replies from P.R.O.s in the correspondence columns of *The Spectator*. The P.R.O. is a phenomenon of the age. Some organisations manage to get along very nicely without him. Others, it seems, are unable to be approached, or themselves make any contact with the outside world, without invoking his services.

Individuals of the tribe vary tremendously in nature. At the top end are those (alas! too few) with whom it is a pleasure to deal. They have a profound knowledge of their firm's products and methods, have a responsible and intelligent appreciation of the sort of material which is wanted by a journal read by busy directors and executives, and can obtain valuable and fruitful contacts. This type of P.R.O. is almost invariably the press officer of a large organisation who can devote all his energies to the interests of the one firm.

At the other end of the scale are peculiar creatures, usually supercilious females with ever-so-cultured drawling voices, whose efforts to obtain publicity on behalf of their clients usually betray the fact that they have never in their lives read a single page of this journal to find out the sort of material we publish. Their brash and presumptuous publicity material is usually prefaced with instructions such as "please send a cutting" or simply "for publication."

Those P.R.O.s and press officers with whom we maintain cordial and fruitful relations will know that these criticisms are not directed at them. Those others who expect us to publish stories of new recipes for the housewife, sales gimmicks for cereal packs and other publicity material not concerned with telling a manufacturing executive about new methods, materials, and machines would be well advised to familiarise themselves with this journal so as to stop wasting their time and ours.

Japanese ham?

THE news that a British trade delegation, with full Cabinet backing, has been negotiating in Tokyo for the unrestricted import into this country of, among other things, Japanese canned hams, causes some bewilderment. Canadian canned ham has been kept out of the country on the plea of shortage of hard currency. Imports from abroad, particularly Denmark and Poland, pour in, yet home production has been steadily declining since 1952. Last year home production was 209,000 tons, and imports were 348,000 tons. We would have thought the Government would do all in its power to encourage home production, yet such, apparently, is not the case.

Desiccated coconut—are we "alarmist"?

OUR remarks in the June issue (p. 227) concerning salmonella infection of desiccated coconut shipments from Ceylon have evoked replies from coconut interests (*see* correspondence on p. 343, where also are published official Public Health statistics of the number of coconut samples examined and the number found to be salmonella positive). We are accused of being alarmist and erroneous. Regarding the latter, we leave readers to judge for themselves from the published figures. Regarding the former, if a British manufacturer supplied food to the market infected to the same extent as some of the coconut shipments from Ceylon, he would soon be out of business. Are we being alarmist in ventilating a matter of profound importance to public health?

Our correspondents do not deny the seriousness of the situation: indeed, by implication they concur, for they state that steps are being taken in Ceylon to reduce contamination risks. Well and good. We hope that the steps taken will not merely reduce contamination but eliminate it completely. Even an infection rate of "only" 2%, which our correspondents claim, is a matter of serious concern.

This is not the sort of problem that arises overnight, and we can hardly accept the contention that the trouble is of recent origin. Certainly, attention has been focused on it only recently, but we reiterate that the root of the trouble lies in the unhygienic

processing methods of some of the Ceylon producers, who just do not know what dirt is. The law must be so framed that the producers of muck are eliminated; at present these producers are penalising the conscientious producers whose products are above reproach. It is reported that some producers complain that the cost of reorganising their businesses on hygienic lines is more than they can afford. As an argument against progress this is nonsensical. Is the health of the British public to be jeopardised, even in the smallest degree, because some Ceylon producers cannot afford to get up to date? It is the customer who calls the tune, and only by making a fuss can he sometimes get things done.

Caterers' vices

An unsolicited object-lesson in food hygiene, or the lack of it, in catering establishments, was given us recently as we sat in a restaurant waiting to be served. A young waiter in a resplendent white coat preparing a large salad dish nonchalantly put the finishing touches to it by scraping out the contents of a jar of mayonnaise *with his fingers*. Had he, we wondered, washed his hands after his previous visit to the toilet?

Getting to the top

In this technical age, personality as well as technical competence is an essential qualification for success. This emerges from a report in *The Times* of a recent management conference in Chester, which says that 95% of failures among executives were for social reasons and not because of technical incompetence.

It is good to know that when the dominant forces in this materialist age seemed determined to turn human beings into automatons, individual characteristics still count for something, at least in the senior ranks. Looking around the industrial scene, what sort of people do we find at the top? Usually men whose most obvious quality is a forceful personality. Sometimes such men are supremely technically competent as well, and increasingly these days do we find technical men in command of affairs, but the men best fitted for running an organisation are those who can use and co-ordinate the abilities and skills of others.

Generally a man who is good at his job but has little personality stays in that job for the rest of his days; there are many brilliant chemists and technologists, with Ph.D.s and a host of other qualifications who never rise above the level of section leader or its equivalent, simply because they have little else but their brilliance. Such men are extremely valuable, but tend to become frustrated, and there are many highly qualified men in industry today who become discontented with their lot, blaming their superiors, their bad luck, anything and everyone except the one person with whom the fault lies, themselves.

"You can't keep a good man down" is as true today as it ever was. This world is not perfect and never will be. The wise man is one who accepts the arrows of outrageous fortune and tries to turn them to his advantage; only the foolish man bitterly resents them. When things go wrong, as often as not there is a human reason somewhere.

An atomic soil-making machine?

When is some enterprising manufacturer going to offer a nuclear-powered soil making machine? Such a project would be of inestimably greater benefit to humanity than bigger and better rockets and missiles. We have referred (see February, p. 47) to the possiblity of reclaiming large sections of the Sahara and other deserts and thus augmenting the world's food supply. Such a dream would be brought a step nearer reality if there existed a machine which could creep forward over the terrain laying a strip of fertile loam 9 inches deep, much in the fashion of a road-making machine which lays concrete. Possibly some existing very large earth-moving and excavating machinery could form a basis.

In imagination recently we saw such a machine, of which Jules Verne would have surely approved, a gigantic affair on caterpillar tracks which moved slowly forward over the desert, scooping up ahead of it a 6 inch slice of the surface material in its 50 feet wide jaws. Inside the machine the scooped material was ground and mixed with phosphate rock, peat, fertilisers, water and other nutrient soil components to give a uniform loam of ideal composition which was then discharged behind the machine in a layer 50 feet wide and 9 inches deep. The power requirements of such a machine would be enormous, and nuclear energy would be needed, but given the necessary funds surely such a machine is feasible.

We offer the idea gratis to any firm or government which feels inclined to take the matter further. Perhaps the United Nations could sponsor such a project. International co-operation would certainly be needed to supply the necessary soil ingredients on such a vast scale. Phosphate rock from the U.S.A., vermiculite from South Africa, peat from Ireland, fertilisers from the industrial nations—all these would have to be brought to the site of operations in giant helicopters or V.T.O. freight aircraft. The cost?—not surely any more than is now being squandered in a futile nuclear arms race, and with inestimably greater returns.

Edible Gelatine Production

New bone degreasing plant at Leiner's factory

Production of edible and other gelatine has received a boost by the commissioning of a new plant costing £100,000 at Leiner's factory at Treforest, South Wales, which FOOD MANUFACTURE recently visited. The new plant enables high quality gelatine to be produced from British bones, hitherto unusable, thus making the industry less dependent on imports.

THE foundation of Leiner's gelatine industry is the Sacred Cow of ancient India. This astonishing statement was made by Mr. R. Egan, Managing Director of Leiner's, to a press party which had been invited to see their Treforest factory, and in particular the new bone degreasing plant costing £100,000 which has recently been put into commission.

Ninety-nine per cent. of Leiner's gelatine is made from cattle bones, which in the past have been imported from India. In that country the cow is a sacred animal; it roams at will, and is not slaughtered for human consumption. Although treated with religious respect by the vast majority of India's 400,000,000 people, there are not unnaturally a few of this population who, for commercial reasons, are willing to go out into the country and gather the bones of these animals. The monsoon rains and the hot sun combine to dry these bones very rapidly and efficiently, bringing them to an ideal condition for gelatine manufacture. This is the reason why bones have been imported from India in the past, for bones from the home butchers' trade could not hitherto be degreased sufficiently for gelatine to be extracted. If the grease content is more than 1% the extraction of gelatine is impossible, and the result is glue.

Mr. Egan said that the basic principles of the gelatine extraction process were propounded by Leonardo da Vinci, who laid down the essential stages—namely, decalcification of bone with hydrochloric acid, followed by treatment with lime, and subsequent extraction with hot water. This apparently simple process is in reality highly complicated, because collagen, the protein structure of bone which provides gelatine, is a highly complex and indefinable organic material which is not easy to extract. The process is a long one, taking more than three months; most of this time is occupied by lime treatment, lasting 90 days, which cannot be hurried, otherwise the protein will be broken down and no gelatine will be obtained. It is this delicate balance between removal of inorganic and unwanted organic materials and the necessity for retaining the complex structure of the protein which makes the process so involved.

(Above): **Main entrance to the offices and factory of P. Leiner and Sons (Wales), Ltd.**

Throughput and yields

At one time, the amount of bone in process at Leiner's factory is 4,000 tons, and the output is 10 to 11 tons per day. Yield of gelatine is 18% of the original bone on a weight basis. The amount of water used by the plant is 2¼ million gallons per day. This phenomenal consumption naturally provides its own problems, particularly in the matter of effluent disposal. All water supplies are obtained from the corporation mains, and for reasons of hygiene the chlorine content is raised to 4 p.p.m. The effluent is discharged into the neighbouring River Taff,

(*Left*): **The graded bone is submerged in 4½% hydrochloric acid in these rubber-lined tanks; the basic tricalcium phosphate in the bone is converted into the soluble mono-calcium salt which is run off in solution, later to be converted into dicalcium phosphate. Ossein, the organic bone skeleton, remains in the tanks and is carefully washed with water to remove all traces of acid, after which it is transferred to the liming pits (*right*) where it is mixed with milk of lime and left for 90 days; the changes which take place here are firstly the physical action of softening and swelling the ossein, and secondly the primary hydrolysis of the protein collagen.**

which runs through the Treforest estate.

New degreasing plant

This plant has been constructed to enable British bone to be used to supplement imports from India. As India becomes more and more industrialised it is naturally seeking to use for its own consumption its native resources, and for this reason the amount of bone available for export has been steadily declining because the Indians wish to use it for their own fertiliser industry and agriculture. To provide themselves with an alternative supply, and also to ensure against the possibility of an interruption in supplies from this rather troubled part of the world, Leiner's have had the foresight to develop a process for degreasing British bones, and thereby provide an outlet for the by-products of the butchery trade in this country. It is claimed that the gelatine obtained from British bones is of much higher quality than that from Indian bone.

The basis of the degreasing process is a three-stage bleaching with hot water after crushing to progressively finer sizes between each stage.

Uses of gelatine

Gelatine is used in a variety of industries, of which the chief are food, photographic, and pharmaceutical. We were interested to discover that among its technical uses is the manufacture of bank notes, to provide a minimum standard of strength for bank-note paper.

The highest grade of gelatine naturally is used by the food industry, and various sizes of granulation are used for different purposes. (For example, 40 mesh is used in confectionery manufacture, crumble gelatine is used in meat canning, and sheet gelatine is used for table jellies and desserts. For pharmaceutical use, 10 mesh size goes for the manufacture of soft-shell capsules, small grist goes for hard-shell capsules.)

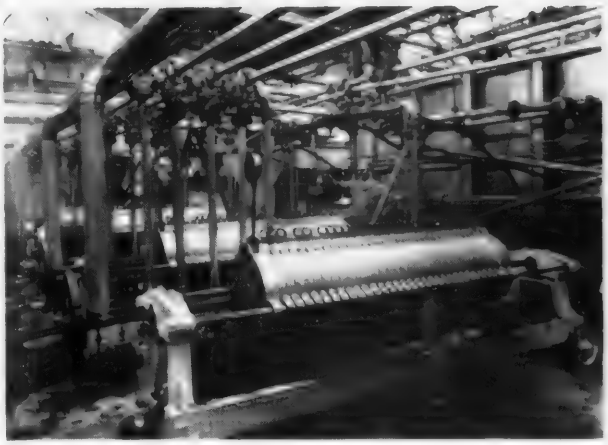
Gelatine manufacture

In outline, the process comprises the following stages:

1. Decalcification of bone by treatment with 4½% hydrochloric acid (four days).
2. Treatment of decalcified bone with 4% calcium hydroxide (90 days). This is more of a physical conditioning process than a chemical one.
3. After washing, the product, which is known as ossein, is extracted six times with hot water, the temperature of extraction being raised by five degrees each stage. By this extraction, the protein layers on the collagen are successively removed. The first two extractions provide high-quality gelatine, and successive extractions produce equally pure gelatine, but progressively inferior in strength and colour.
4. The liquor is concentrated in vacuum evaporators to 25% gelatine content. The concentrate after cooling sets to a solid mass of rubbery texture which is then diced, dried, and packed.

An important by-product of the

This is the precipitation plant in which the dicalcium phosphate for "Trefosphate" is precipitated from the phosphate liquor by the addition of lime at a very carefully regulated rate.



(*Left*): **From the boiling tanks a solution of gelatine is obtained which is pumped through this battery of filters to remove all traces of suspended matter.** (*Right*): **Part of the evaporation plant for concentrating the gelatine solution. As gelatine is very sensitive to heat, the evaporation time is cut to a minimum and the temperature is controlled within very fine limits.**

process is the calcium phosphate liquor resulting from the treatment of bone with hydrochloric acid. The phosphate is precipitated and dried, the resultant material being sold under the brand name *Trefosphate* for use in animal feedingstuffs.

Decalcification

Dry crushed bones are pumped in the form of a slurry with water into large wooden vats, which are topped up with 4½% hydrochloric acid. The vats then stand without agitation, sufficient agitation being provided by the continuous release of gas. Equal weights of bone and acid are used, and the temperature is controlled between 58 and 65°F. Batch weight is 17 to 20 tons, and the process of decalcification lasts four days.

At the end of this time the acid is drawn off and the bones are washed two or three times with water.

Lime treatment

The washed bones are pumped in slurry form into rubber-lined pits and allowed to stand in contact with 4% lime solution for twenty-four hours. It is then pumped into the lime pits.

These, of which there are a large number approaching 200, consist of brick or concrete rectangular tanks holding 15, 24, or 60 tons.

The necessary lime is quarried nearby, kilned, and slaked. The 4% solution is changed every eight days, intermittent agitation with compressed air is provided every five days to prevent the growth of anærobic bacteria.

Production of ossein

After the lime steeping process, the slurry is pumped into rotating drums, where rough lime particles are washed away with a jet of water. The bone is then pumped into one of twelve pits, in which it remains for four days, during which it is agitated by large revolving wooden paddles which are switched on for 15 min. every hour. Clean water is continuously introduced during this time, and the lime water removed through a screen, which holds back the bone particles. At this stage the material is treated with acids and alkalies to achieve the desired *p*H for cooking, and also a measure of bleach.

A bacterial test is made at this stage. It is vitally important to maintain bacterial checks all the way through the process, as gelatine is highly susceptible to bacterial contamination.

Extraction

The result of this process is ossein, a whitish, flabby material having the original shape of the bone pieces, and which consists mainly of collagen, the bone protein.

The ossein is extracted batchwise in large tanks holding 16 tons apiece. The ossein is pumped to the tanks, which are then filled with water at an initial temperature of 130°F. The water is circulated through the bone mass by stirrers, and extraction time is two hours.

At the end of this time the liquor, which contains 5 to 6% gelatine, is drawn off, and is filtered through a number of 32-leaf filter-presses under pressure.

After each batch the filters are dismantled, and the filter pads are sterilised by boiling water.

After six extractions, the extraction temperature being raised five degrees each time, there should, theoretically, be no residue. In most cases a small residue is left, and it is either put back through the whole process, or else is boiled up to make glue.

Concentration

After filtration the 5% liquor is concentrated to 25 to 30% in five three-stage steam-heated vacuum evaporators. As previously mentioned, the liquors from the first two stages provide the best gelatine, which is practically colourless and tasteless, and is used for table jellies. The concentrate from the evaporators, after passing through box filters, is collected in aluminium tanks.

The hot liquor is then fed by gravity to the outer surface of a rotating drum, which is cooled by refrigerated brine. A sheet of solid gelatine is formed on the sur-

(*Left*): **The dry gelatine is transferred to containers and then to the blending plant, part of which is shown here, for grinding, according to the final grade required.** (*Right*): **The byproduct of ossein gelatine, dicalcium bone phosphate, is a highly nourishing supplement for cattle feeds and a valuable fertiliser. Seen here is the filtration plant used in the manufacture of "Trefosphate."**

face of the drum, goes round once, and is peeled off continuously by an endless belt conveyor, which takes the sheet to a chopping machine. This chops the gelatine into small pieces.

Drying

At present drying is carried out in rectangular brick pits having bottoms of perforated metal sheet. Beneath these sheets are steam pipes, which heat the air blown through the sheets. The warm air blows through the gelatine and dries it.

The gelatine is stirred periodically with long shovels, and the drying takes 12 to 15 hrs.

We saw the prototype of a new drier with which the firm intends to replace the drying bays. This consisted of a large circular pit into which the gelatine is put and stirred continuously by a slowly rotating mechanically driven stirrer.

The dry gelatine is bagged out and taken to the grinding department, where mills grind the gelatine to varying grades of particle size. At one time the gelatine was pumped out of the drying pits through a suction line, but the dry gelatine was so abrasive that it damaged the conveyor and carried through particles of the metal on to the lining of the pipe, which contaminated the finished gelatine. This method was therefore discontinued.

Before entering the mills the gelatine passes over electro-magnets which remove any tramp iron which may have found its way in.

Gelatine from skins

A very small amount of gelatine is extracted from pig skins by hot water. The skins are placed in tanks and the water is continuously circulated. The liquor contains fat, which forms a layer on the surface. This fat is skimmed off and is sold mainly for margarine manufacture.

Bone degreasing plant

The new bone degreasing plant is situated about two miles from the main factory where, in addition, there is a hydrochloric acid plant which makes the vast quantities of hydrochloric acid used in gelatine manufacture.

The bone is fed on to an inclined conveyor belt, which takes it to a crusher. This reduces the size of pieces to two inches. The bone drops by gravity into a long trough, along which it is moved by screw conveyor while hot water at about 180° F. is circulated countercurrent. Some fat is removed in this process. The bone then goes through two further extraction stages in similar manner, first up an incline conveyor to a crusher and then by gravity to a trough with screw conveyor, each successive crushing reducing the size of pieces until the final size is about ½ in. thick.

The fat-containing hot water is pumped through a centrifugal separator which removes the fat. This is pumped through a clarifier to storage tanks and despatched in 10-ton road tankers for tallow manufacture.

At present about 25% of the gelatine produced is made from British bones. The company say that they can use all the British bones they can get, although they emphasise that they have no intention of reducing their imports from India.

The new bone degreasing plant, which makes possible the use of British butchers' bones. In the foreground is an inclined conveyor, crusher and trough fitted with screw conveyor in which the bones are extracted with hot water.

Phosphate recovery

The only commercially important by-product from gelatine manufacture is calcium phosphate, obtained from the decalcification process. The acid after the decalcification stage is pumped to tanks where 4% lime solution is added and calcium phosphate precipitated. This is washed three times with water, each successive lot of wash water being decanted to waste. The dicalcium phosphate is pumped away and dried in a large steam-heated rotary drier; this consists of a large cylindrical structure containing a number of cages down which phosphate falls under gravity while a stream of heated air is pumped up through. The dried material is then bagged off.

* * *

Leiners claim to be the largest gelatine manufacturers in Britain and the largest producers of ossein gelatine in the world. They have raised their production standards to a very high figure, and have invested a considerable amount of capital in new plant to achieve these standards. Throughout every stage of production careful quality control checks are made and great care is taken to prevent bacterial contamination. Well-equipped research, analytical and bacteriological laboratories keep a close check on every batch that is made.

The factory employs 500 people, of which 375 are process shift workers, and production is kept going 24 hr. a day 7 days a week throughout the year, with the exception of Christmas Day and Boxing Day. Three shifts of 125 men each maintain this continuous production.

Although not within the scope of this article, we saw the hydrochloric acid production plant, which is a marvel of electrical engineering, and this, together with the lime quarries, makes the firm self-contained and a noteworthy asset to the industry of South Wales. Their interests in India, the U.S.A., Canada, Pakistan, and South America make this truly a world-wide company.

SUPPLIERS OF EQUIPMENT

Much of the plant has been made by Leiners themselves. Among outside suppliers are the following:

Alfa-Laval Co., Ltd.: centrifugal separator.
U.D. Engineering Co., Ltd.: refrigeration plant.
Q.V.F., Ltd.: glass cooling coils.
Pulsometer Engineering Co., Ltd.: pumps.
L. A. Mitchell, Ltd.: acid pumps.
British Westinghouse Brake and Signal Co., Ltd.: germanium rectifier set.
Miracle Mills, Ltd.: mills.

Basic Elements of Nutrition

FROM America comes a text-book* with a "new look," a compact well-produced discussion of the basic elements of nutrition. First impressions are of the clear bold type, the lavish number of animated diagrams and graphs, readable at a glance, and the excellent photographic illustrations.

Written for the student just beginning the subject of nutrition, it provides basic information at elementary level. The preface states that no presumption is made regarding the chemical or physiological background of the reader, and at the beginning of the book is a chapter explaining necessary terminology. The principles of chemistry and physiology necessary to understand basic factors are explained, and these principles are applied to the selection of an adequate diet, the study of food habits, and the assessment of good and poor nutrition (with special stress on obesity).

An account is given of minerals, additives in food and antibiotics as nutritional factors. Other chapters are devoted to such subjects as food fats, diet and dental health, dietary needs of children, and the food requirements of special groups. The book is completed by a glossary, tables of dietary analyses and nutritive values, and an index. At the end of each chapter are copious references, both for documentation of the subject matter and for further reading.

For what it is, an introduction to the study of nutrition, it can be recommended.

* *Principles of Nutrition.* By Eva D. Wilson, Katherine H. Fisher and Mary E. Fuqua. John Wiley and Sons, New York, 1959 (London, Chapman and Hall). Pp. 483. 48s. net.

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Your Pest Problems—

What you should know

By E. E. Turtle,* M.B.E., M.Sc., Ph.D., F.R.I.C.

The author considers the problems of pests in stored food from the commercial man's point of view, and is mainly concerned with stating the problems which he meets and not the means by which he overcomes them. A knowledge of the problems is necessary before the correct steps can be taken.

ONLY a small proportion of our food, such as cereals, peas, and beans, is produced at home. All of our dried fruits, cocoa, maize, and oil seeds come from overseas. As a result of this:

1. most of the storage capacity is situated at the ports;
2. many of the pests are already in the commodities when they arrive here; and
3. (as an incidental effect of 2) there is more accent here on methods of treating commodities which are already infested (*i.e.* the use of fumigation) than on methods of preventing them from becoming infested (*i.e.* the use of contact insecticides).

Goods in a warehouse being fumigated with methyl bromide under gas-proof sheets.
(Both photos in this article are by courtesy of the London Fumigation Co., Ltd.)

Food commodities arrive in this country either as general cargo, in which case they are usually contained in bags, boxes, or other packages, and are stored in general warehouses, or they come in ships used only for the one commodity, in which case they are often in bulk. Cereals fall into the latter class. As they form such a major part of our basic foodstuffs, this article will consider first cereals on their own, then problems in general warehouses, and, finally, problems in retail distribution.

Storage of cereals

Cereals mostly arrive in bulk and are unloaded in bulk. Some are in bags and stored in bags. The importance of any insects in grain on arrival depends very largely upon what it is intended to do with the particular shipments. For example, a major part of our tonnage of wheat passes rapidly to mills and similar premises where it is used up within a few weeks. The commercial difficulties with such grain are largely limited to preventing spread of insects to other stocks in elevators and to trucks and machinery used for other commodities.

Merchants may also be troubled by dockers or other workmen who complain of the insects and dust associated with infested grain. Although the strengths of such complaints vary from port to port and from time to time, depending upon prevailing industrial relationships, they are often dealt with only by the payment of "dirty" or "buggy" money, which involves a charge on the goods. Provided the grain owner takes reasonable precautions to prevent the insects spreading to other commodities, however, at present Ministry inspectors do not normally require him to fumigate the grain as they could do under the Prevention of Damage by Pests Act.

Bulk storage problems

If the grain is intended for storage, however, insect infestation is a major factor. This was amply demonstrated during the war when governments in many countries had to store grain for long periods, either as reserve stocks or due to their inability to ship it abroad.

The storage of grain in bulk involves special problems which

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have been studied fairly intensively during recent years. Much more is now known than was the case, for example, in 1938, when the government decided to set up reserve stocks of grain in this country. The commercial man can hardly be expected to know the detailed findings of this work. (Neither is it possible to review it adequately in an article of this length.) But there are one or two outstanding facts which he can hardly be unaware of if he undertakes the storage of grain in bulk as a practical proposition. These are that:

1. a large number of species of insects can infest stored grain;
2. these species behave in very different ways; some cannot be detected until they have caused damage (*e.g.* *Læmophlœus* beetles in the midst of a bulk); others can at times cause alarm out of proportion to the damage which they do (*e.g.* caterpillars of *Ephestia elutella* at the migratory stage);
3. in the course of their consumption of food, insects, like all other animals, give off heat, which is not readily conducted away by grain and therefore normally causes a rise in temperature; this rise in temperature, which sometimes occurs in restricted localities known as hot spots, can cause movements in moisture, with drying out in some places and condensation in others, and at the latter points secondary damage can occur from mould attack.

Even if he does not stop to consider these facts in themselves, practical experience during the war and since has taught the storage manager that, if he wants to store grain in bulk:

(*a*) he must constantly look for insects and for heating;
(*b*) he should get advice on the importance of these insects and of any heating which he finds;
(*c*) there are effective methods of treatment for most kinds of outbreaks, but these differ according to the nature of the storage (*e.g.* silo or floor storage) and the kind of infestation (*e.g.* hot spots or surface infestations).

Storage in bags

If the grain is in bags, the only difference from grain in bulk is that it is a little easier to detect the presence of insect infestation and also a little easier to treat it once it has been found. With grain in bags, there are also problems from rats and mice which do only little damage to grain in bulk because they can only get at the outside surfaces.

Rats can do damage to bagged grain by gnawing the sacking of bags; but mice are usually more damaging. In some cases the mice form their nests in the middle of the stacks; they make small holes in the bags and the grain runs out. This kind of damage is worse with some kinds of grain, being particularly bad with barley and oats. In our experience stacks of barley have become little more than bulks of grain with torn sacking amidst them after a few months of attack by mice.

General warehouse-keeping

The practices of warehousing vary to some extent from one port to another, particularly in the degree to which the warehouses act as general or as specialised warehouses. Although there are some specialised warehouses at all ports (*e.g.* spice warehouses, cocoa warehouses) a substantial proportion of the port warehouses take in a range of commodities.

These commodities are usually in bags, boxes, or cartons of some kind. The problems of the specialised warehouse keeper are rather easier than those of the general warehouse keeper. He gets to know what insects are usually to be found in his commodity; he also knows whether they are commercially important. With dried fruits, for example, he knows that even single insects may cause complaints, whereas quite large numbers on oilseeds may pass unnoticed. In the case of the general warehouse keeper, however, both the range of commodities and the range of insects is wider. He can hardly be expected to recognise all the insects concerned, neither is he in such a good position to appreciate their importance. He also has the added difficulty of preventing insects passing from one commodity to another.

The warehouse keeper's job

Broadly speaking, insects brought in with any goods are the responsibility of the owner of the goods. Insects or rodents gaining access to the goods during storage and any damage done by such pests are the responsibility of the warehouse keeper.

It is the warehouse keeper's job firstly to ensure that the room to receive the goods is free from insects. To do this he normally employs simple, hygienic measures plus the use of contact insecticides (such as sprays containing BHC, DDT, or malathion; or smokes), which are used in the empty structure.

Secondly, he must prevent pests from gaining access to the goods. With rats this is done by:

(*a*) proofing, to prevent their getting in (a difficult, if not impossible, task in very old buildings);
(*b*) ensuring that the neighbourhood is as free as possible; this is normally done in co-operation with neighbours and the local authority, and is often complicated by the facts that the properties usually are old and situated in densely built-up dockland areas;
(*c*) treatments within the building.

The last is most important with mice, which normally live within the building rather than entering daily from an outside source.

Where birds are concerned, and in some localities these are a nuisance by fouling goods in the warehouseman's charge, the first of these measures (*i.e.* preventing their entry) is the only one which can be used.

Assuming that the warehouse keeper has his premises free of insects to receive clean goods, he still has to prevent insects getting on them. Access from other goods is minimised by storing only like goods near to one another and by other aspects of good management; but this alone is not sufficient because some of the insects can travel considerable distances, both within buildings and from one building to another. The cocoa moth (*Ephestia elutella*), for example, is endemic in the London dock warehousing area, and commodities such as cocoa and dried fruits stored in this area are liable to become infested. It is to prevent such access that clean infestible commodities are sprayed with films of pyrethrum-type insecticide as a routine during the late spring and early summer.

Obviously the general warehouse keeper must be on his mettle if he is responsible for commodities, such as dried fruit or cocoa, which are quite commonly fumigated and therefore free from infestation at the time when they are put into store.

Fumigation of cased goods with "Etox" and carbon dioxide.

Retail distribution problems

Of particular concern under this heading are products such as flour, porridge oats, semolina, custard powder, and chocolate, and the premises concerned range from flour mills to merchants' warehouses and to retail grocers and confectioners.

From the trader's point of view the special feature of infestation at this stage is the proximity of insects or damage to the final purchaser. In Britain, although our hygienic standards have not reached the same standard as those in the U.S.A. where quite a small number of fragments of insects or of rodent hairs can lead to a prosecution, there is an increasing public awareness of any contamination of food—for example, any housewife purchasing food containing insects or mites, or obviously damaged by these or other pests, will at least tell her neighbours about it; sometimes she will go to the Public Health Inspector.

Informing the Public Health Inspector will often lead to a prosecution under the Food and Drugs Act. With mouse damage the fault is normally the retailer's and the remedy is also his. With insects, however, determining the responsibility for the infestation is a problem on its own. The retailer often claims that insects could not have entered the goods on his premises and therefore the original manufacturer was responsible for the presence of the insects.

In many cases courts accept this plea. In the course of our work in Infestation Control Division we have inspected a number of factories following complaints of insects in retailed products. In some cases the evidence has suggested that insects, their eggs, or their larvæ were packed with the goods. In many instances, however, no evidence of these insects has been found and it must be supposed that they obtained access after dispatch. There is, in fact, a good deal of evidence that there are more insects in distributors' warehouses and retail shops than is popularly supposed. An example is the following evidence regarding the cocoa moth *Ephestia elutella*.

A certain chocolate manufacturer who, over a period, received a number of complaints about the presence of caterpillars in boxes of chocolates, decided as an experiment to pack some of the production in an insect-proof pack. This pack had been tested under rigorous conditions and was quite definitely insect-proof. Complaints immediately ceased with the product packed in this way even though any eggs or larvæ of the cocoa moth could have bred up if they had been included in the pack. On the other hand, complaints continued with the product distributed in the former packs which were not insect-proof. Parallel with this information a survey of some retail confectionery shops was carried out by insect inspectors of the Ministry in conjunction with a Public Health Inspector in a certain London district. A surprisingly large number of these shops were found to contain specimens of the moth *Ephestia elutella*, and many of the occupiers of the shops were quite unaware that they had the insect there.

It is a too common feeling that a particular retail package is insect-proof. Distributors often do not realise that young larvæ can pass through very small cracks and crevices and that certain

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WORLD FOOD SUPPLIES—7

World Requirements – II

By Francis Aylward,* Ph.D., D.Sc., F.R.I.C.

This article, the last in this series (which commenced in February), draws attention to the various meanings attached to the word "hunger" and points out that when analysing statements on the subject, a precise knowledge of what meaning is intended is necessary to avoid confusion. Self-help is an important factor in dealing with regional food problems, and here education plays a part.

APART from the normal and traditional use of the word "hunger," the word has been employed occasionally by the physiologist in a restricted and technical sense of "specific hungers," that is for some one food component (a point which can be illustrated by the migration of wild animals in search of salt).[6] De Castro,[7] in his *Geography of Hunger*, has broadened the term "hunger," and as Boyd Orr has noted[3] (p. 5), has used the word to indicate the "lack of any of the 40 or so food constituents needed to maintain health." It is on this basis that de Castro states that ". . . two-thirds of the world population live in a permanent state of hunger" (p. 14); and that ". . . there is not a single country in South America in which the population is free of hunger" (p. 74); there is a "hunger area in the United States" . . . in "a region with about 500,000 square miles of surface and a population of some 30,000,000 people" (p. 112).

This extension of the use of the word "hunger" while no doubt justified as a means of drawing attention to a major problem, can and has led to confusion among writers and others who are not aware of the definition. In any serious enquiry, it is necessary to define terms, and this is especially necessary in an *international* enquiry; translations from one language to another may remove or accentuate distinctions between words and phrases.

An aspect of FAO's work. An FAO forest expert, Mr. D. A. Francis, discusses a reconnaissance flight with the crew of a specially adapted D.H. "Dove" aircraft which has recently been carrying out an aerial survey in the Sudan of the Dom palm, found widely scattered along river banks which would take many months to survey by traditional ground methods. (*FAO photo loaned by Ministry of Agriculture.*)

What is hunger?

The term "hunger" is used by different authors in different ways. It may cover a wide range of conditions; outright starvation or inanition, through various degrees of malnutrition, to minor (even if important) specific nutritional deficiencies leading to such symptoms as bad teeth or other localised complaints. It may mean equally the desire for food after a voluntary or enforced fast.

The scientific worker, writing on nutritional problems in a scientific or technical journal, aims at concise and exact terminology, but it is very easy to "translate" technical terms into popular speech with a complete distortion of meaning. Thus the use of the word "hunger" as used in De Castro's book creates in the mind of the ordinary reader a picture of men dying of starvation in the streets of India or starving to death in garrets in London. Unfortunately there is such acute starvation in the world, but it represents only one aspect of the picture world-wide "hunger" given to us.

Boyd Orr[3] in his preface to de

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Castro's book notes that the term hunger in the past "was used to mean lack of food to satisfy appetite, and the number of deaths from hunger limited to the emaciated people who died from sheer starvation as in famine." There is a strong case for retaining this concept and to retain also the older definitions:

(i) *under-nutrition* (or under-nourishment)—equivalent to a deficiency of energy foods;

(ii) *mal-nutrition* (or mal-nourishment)—equivalent to a deficiency of specific nutrients (or by a lack of balance between them) caused either by a lack of nutrients in the diet, or by their ratios or by metabolic disorders, or by pathological conditions.

If definitions such as these are used then it is possible to work out a constructive programme on a national basis (for example, to deal with bad teeth in a country such as England, where the *general* level of nutrition is high). Similarly we can approach international problems by distinguishing between areas that require immediate aid in respect to energy-containing foods and areas—not necessarily the same—where there is urgent need for special nutrients as shown by clinical reports.

Hunger and hunger areas

It is within this context that the phrases referring to "hunger areas" must be examined. There are many diseases, such as nervous disorders, prevalent in Europe and the Americas, which affect all classes of the community, but it would be quite wrong to state "that the whole of Western Europe is in a permanent state of nervous disorder." The false phraseology is here immediately apparent.

It may be said with truth "that there is not a single country in Western Europe in which the population is free from nervous disorders," but this pronouncement means little without precise information on the percentage of people in each country suffering from such disorders. Similarly with the statement about "hunger" in South America, it is necessary to know what percentage of people in a region is suffering from under-nutrition and or malnutrition and in what forms. Only then can practical steps be taken to remedy the situation.

Poverty and disease

Many writers on international questions are guilty of false logic by implying that food shortages are the cause of all disease. This is certainly not true. The genius of Pasteur revealed the rôle of micro-organisms, and it is well recognised that bacteria, together with viruses and parasites of one form or another, are responsible for many of the common medical disorders in Europe and for a host of disorders endemic among the peoples of Africa and Asia. The advances in hygiene, springing from Pasteur's discoveries, together with more recent developments of chemotherapy, have almost certainly had a more profound effect in controlling disease and reducing the death rate over the past 80 years than any advances in nutrition.

It is really only in the past three decades that our newer knowledge of nutrition has been applied, and in a very limited number of countries, more especially those with a relatively high standard of living.

Nevertheless, an assumption is often made that high infantile and maternal mortality rates and the low expectation of life in the countries of Asia and elsewhere are due almost entirely to lack of food.[3] Although there is no doubt that good food can increase man's resistance to certain infections[1, 7] and has contributed to the increased and increasing expectancy of life in certain European countries, in the U.K. and elsewhere, it is clear that improved public health measures such as sanitation and isolation of people suffering from infectious disease, have had, and will continue to have, an important place in preventive medicine. The eradication of malaria is still a major goal in public health in many regions.

It is true that disease *may*, and often does, spring from poverty, but this is not necessarily true. Many diseases strike at the rich and well fed as well as the poor living on a more meagre diet, and moreover certain diseases are associated not with poverty but with comparative wealth (see, for example, coronary disease, various types of nervous disorders, and some virus infections).[24, 30, 33]

Because of the above considerations it is necessary to view with a critical eye the various statements that are made correlating vital statistics (especially life expectancy) with food consumption expenditures. A primitive race may be poor, the family wages received per week may be minute by Western European or North American standards, but its physical endurance may be excellent. A second primitive group in contact with the Europeans, may on the other hand be subject to many disorders; its simple standards may then produce a host of secondary effects including lack of purchasing power for European (or other) foods, of medical facilities, of public health measures and of schools; all of which may conspire together to produce a decline in health. But in all areas and with all groups we must attempt to distinguish between primary causes and subsequent events.

Mutual aid and self-help

The above criticisms are put forward because it seems necessary to obtain a sense of perspective in food and nutrition questions; the fact that some published statements are incorrect, however, does not imply that there are not serious problems to be solved.

It is known that in different parts of the world there are some large and small islands where the food supply is insufficient for the population and where (unlike, for example, Britain) economic conditions at present hinder the importation of supplies and where (unlike, for example, Malta) continuous emigration cannot at present readily take place.[9] It is clear also that in a number of densely populated cities of Africa and Asia (as well as other contin-

ents) conditions of living and standards of hygiene and nutrition are poor and that intensive efforts are required to effect improvements. In Europe the slums of great industrial cities have been the classical black spots on the nutritional scene.

It is known, too, that there are regions of excessive mono-culture where there is urgent need for the reduction of single plantation crops and their partial replacement by other types of crops of greater nutritional value. And in a fourth category of regions of special difficulty are those which are susceptible to famine arising from crop diseases or droughts and where pest control and allied measures combined with irrigation schemes are needed.

A primary task of F.A.O., in co-operation with the World Health Organisation and U.N.I.C.E.F. (the United Nations Children's Fund), is to collect the necessary facts and then to stimulate programmes of aid, through international and national as well as private agencies.[11, 25, 31] There is general agreement on the necessity of mutual aid between different nations and also on the age-old principle that the best type of aid in the long run is the programme that can lead to self-help —to create conditions so that people are ultimately in a position to help themselves. In this category comes not only physical projects such as dam building or irrigation, but educational projects such as the training of local leaders in agriculture and other technologies and in food science, nutrition, and medicine.[11, 15, 16]

Another aspect of FAO's work. This member of a survey team in Peru uses a llama as a table. (*FAO photo.*)

SUMMARY AND CONCLUSIONS

In the introductory article of this series, "Sources of Food" (Feb. and March), an account was given of the many practical programmes proposed to increase the world's food supply to meet the urgent needs of the times. It was stressed that the biochemist, the food technologist, and the agricultural scientist is on the whole optimistic that much can be achieved quickly by applying information now available and that programmes of technical and agricultural education in developing countries must be given a high priority.

In the second review on the "Choice of Foods" (April) evidence was put forward to show that the local foods of a region may be of excellent nutritional value and that in such areas the most effective aid may be through programmes designed to improve and reinforce indigenous agricultural and food processing techniques. In these and other regions it may be necessary to recommend the introduction of supplementary crops and to make certain that minor but traditional local foods are not dismissed by the western "expert" as worthless (at least until he has conclusive proof to this effect).

The third review, "Standards of Nutrition" (May and June), indicated the many areas of research in biochemistry, physiology, and nutrition that still await full investigation, if we are to be in a position to assess the food needs of the individual or of the local or international community. Attention was drawn to certain assumptions (for example, the supposed necessity for animal protein) which may be untrue; clearly there will be a vast difference in a programme that aims at supplementing existing plant proteins and an alternative one which proposes to raise the milk supply to the levels of countries with temperate climates.[17,29]

In this concluding article on "World Requirements," attention has been drawn to the difficulties facing the clinician in deciding on standards of nutrition, especially because of recent work on the extent of individual variations and on human adaptive processes. It has been pointed out also that new uncertainties have arisen because of the evidence that rapid initial growth may be undesirable and that body weight is not necessarily an index of optimum nutrition.

Finally, an account has also been given of the difficulties in deciding on the extent of human undernutrition and malnutrition by the indirect methods commonly used; evidence has been noted that the world picture may be somewhat better than that com-

(*Concluded on page 344*)

Machines—the Workers' Angle

By L. B. Scott

An efficient and harmonious labour force is essential if a factory is to run smoothly at high output. This article suggests that in the design of machines and plant not enough attention is given to the comfort of those who have to operate them, and indicates those fields in which there is usually much room for improvement.

THE food industry is one which is largely dependent upon women for its labour force. This is plainly a matter of economics, as many of the functions now performed by women could equally well be done by men, but the fact remains that we tend to associate the canning and freezing sections in particular with hordes of women, busy on preparation, packing, and finishing the many products of today.

A young executive can have but little idea of the conditions in the industry not so many years ago, and he would probably boggle at the thought that such machines as existed were to be found at the can-closing end of the plant, whilst spread throughout the other parts were women and girls of all ages peeling vegetables, eviscerating fish, filling soup by ladles, and labelling cans by hand.

Yes, indeed, in those days, the foreman had to be a psychologist, as well as a canner, for he knew by experience that young girls made excellent labellers but poor vegetable peelers, and so he sorted out his women to suit his requirements.

Function not the only consideration

Those days have very nearly gone now, and machines of all shapes and sizes, and for all manner of purposes, can be seen in every branch of the industry; but women still have a vital part to play, and this article will deal mainly with the women's rôle in relation to the machines, and is meant to serve as guide to thinking by management and designers not only of machines, but also of women.

How often have you, the reader, given this the attention it deserves?

For obvious reasons, machine designers tend to concentrate on the functional angle of the machine, but is it not worth pausing to think that the machine will, in most cases, be operated by women? Not only operated, but in some processes, women "feeders" are required. Is enough thought given to the conditions under which the women operators or feeders will have to work?

How often has a machine been ordered without regard to the working space required, and, when installed, how often has the resultant congestion made working and servicing it quite difficult, and the potential efficiency of the machine being greatly reduced thereby?

With the growth of other industries competing for female labour, in which attractive and congenial conditions are offered, a challenge is given to the canning and freezing industries which has to be taken up, as indeed it has in many modern plants, but there are still some lagging well behind.

It is suggested that the reader take a walk through his plant, checking on the points raised, and if he finds no fault, happy is he indeed, for his plant is probably the only one of its kind in the country!

Noise

Readers will recall that the May issue drew attention to the noise in canning factories in particular, and no apology is made for returning to the subject. Should we start by asking ourselves: "Is all this noise really necessary?" For example, have you ever asked yourself why the delivery of empty cans from a can store to a filling line should be responsible for at least 90% of the noise? In any factory using a "scrambler" and star feed system, or even the single track, the clatter of cans as they roll along galvanised iron tracks makes ordinary conversation impossible on the factory floor.

It is bad enough in a spacious plant, but in the low-roofed ones, the "absence" of noise is only fully appreciated at break times. Only then can you really "feel" the peace which exists, and is such a relief to all those in the place.

Are your machines noiseless?

In such a noisy atmosphere, the usefulness of "music while you work" is largely wasted, and the undoubted time-saving of the "calling" system is brought to nought by the competing noises.

Is it beyond the wit of man to devise some method of noiseless can delivery? Whoever does so will confer a boon and a blessing on employee and employer alike.

If you doubt it, visit the nearest fresh fruit packing station, and measure the noise there against that of your plant.

Now let us look at your machines! Are they really as silent running as they could be? You probably have a blancher, which is a heavy piece of equipment, and some effort is required to make it revolve. It can so often be a rumbling giant, taken for granted that it cannot be silenced. How is yours?

Is your exhauster of the type where, if you want to tell your

operator something, you have to yell?

Some of you may have drying units installed, either for dehydration or similar purposes. You know that enormous fans are used to blow hot or cold air across whatever you are producing. The noise volume in such plants where the shell of the unit is thin, is akin to that of an aeroplane being "revved" up, and this goes on all day.

There are many and varied machines in use today, but the acceptance of noise as a virtue is much too commonplace, and it should be inserted in every order for a new machine that a condition of acceptance is that the machine shall be as noiseless as possible. Have you tried that approach? It could be well worth thinking about. Better still, go and hear the machine running before you buy it.

How long do you leave your office door open if there are a few typewriters going in the next room? Is it not true that you can work better in a less noisy atmosphere? The same goes for your employees! Reduce noise, and you reduce nervous tension, you lessen your accident risk, and above all you will increase the efficiency of your plant.

Water

Water is the commodity most largely used in canning and freezing, whether as an actual ingredient or for use in the preparation of the product, the processing, and finally for washing down. Millions of gallons are consumed daily, and very often, because it is cheap, it is allowed to "slosh" around.

Is there room for improvement in the use of water? Perhaps your business is fish canning. If so, you know water figures very much in your every-day activities.

Before the advent of the nobbing machine, women were employed to sever the head and remove the gut from the fish, be they herrings, pilchards, or mackerel. This was a messy job, and the women wore rubber boots, oilskin skirts, and aprons for protection. An experienced woman could process about 1,000 fish per hour, and many women were required to keep the supplies up to the packers. Today, the nobbing machine has in many instances supplanted the women, and two operators can feed about 10,000 fish per hour through the machine.

Floods of water! We feel sure that these women in a pea canning factory would be much happier if working conditions were drier.

Alas, the women still wear the same protective clothing, and the job is still a messy one. Much of the trouble is due to water which is used freely on the machine, but how much more effort would have been required to have produced a machine so encased that if water has to be used, it need not be to the discomfort of the feeders? As it is now, the machine drips water, the floor is wet, and often it is necessary to pay the feeders extra money to compensate for the discomfort.

It is recognised that water must be used extensively in fish canning, as the fish are washed to remove scales and have to be immersed in and taken out of brine tanks, with a great deal of spillage; the operation is often done in a seperate department. If you, my reader, are involved in this, walk now through your plant, and see how you can improve the working conditions of your women. At the same time carry on a thorough inspection of all water outlets and water users. You will be surprised at what you will be able to do to better conditions, and, of course, save your water consumption.

It is not only in the fish canning industry that water problems arise, so whatever industry you are in, whether it be fruit or vegetable canning, you may be sure you will find a source of discomfort, and any effort to eradicate this is well worth making. It is not impossible to channel water away from machines where water is necessary, and here also designers should be asked to cover in their machines as far as possible, and not leave them, as they often do, as mere working shells. Refinement, you may say, but a little refinement has worked wonders before, and will do so again.

Steam

Can we now have a look at some of the steam using equipment in your plant? Are you satisfied that everything is being done to prevent steam hanging around like a giant cloud over your employees? Steam and condensation go hand

in hand, and to be the target for drips until the steam clears away is anything but conducive to good output or to good quality, quite apart from the harmful effects on the factory roof.

Not all plants are equipped with extraction units, so may we look at a few examples of where they are mostly required?

Syrups and brines for fruits and vegetables are very often made in large stainless steel pots, and are pumped to smaller containers above the machines where they are to be used. If no steam hoods or extraction units are used, natural ventilation can never get rid of the steam in time to avoid unpleasantness, and we do get some days when air movement is so little that the steam hangs around all the time. Blanchers and exhausters can add their quota, and open-end types of exhausters are particularly bad without hoods of some sort.

One rarely sees pickle and sauce boilers without hoods, nor yet soup pots, so why not have all such utensils suitably covered so that no nuisance is created?

Have a look at your retorts, especially if they are of the horizontal type. We all know they must be vented during coming-up periods, but a lot of steam is let loose during coming-down periods and it is so easy to continue the exhaust valve pipe to where it will cause no trouble.

Accidents during cleaning down

Naturally, cleaning down a plant requires steam in some way or another. Either it is used to provide tanks of boiling water, which is then trundled along in soup bogies with the valve open, or it is piped direct to a mixing unit attached to a rubber hose. In either case, it is not uncommon for operators to be scalded.

Would it not be a good thing if machine designers were to incorporate a built-in cleaning system in their machines so that the operator has merely to press a button and the whole job be done without risk?

There are many machines in use in the canning and freezing industries which need just that little refinement, but as this article only introduces the point, it cannot be other than a guide to readers as to where they should look for possible improvements in their own set-up.

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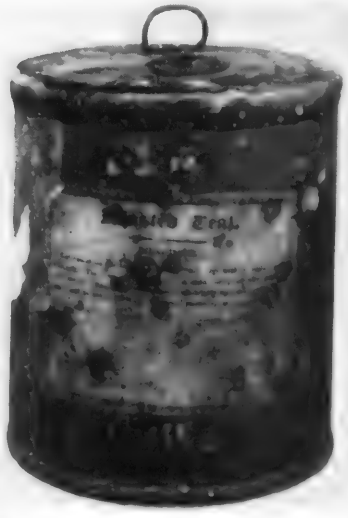
150 Years of Canning

FROM very modest beginnings over 150 years ago, production of the tinplate industry in the U.K. has grown to 1 million tons yearly, sufficient for 6,000 million tin cans—more than two cans a week for every man, woman and child. The man largely responsible for the introduction of tin canning was Peter Durand, whose specification in 1810 has led to such a change in our domestic cooking habits. Organisations including the British Tin Box Manufacturers' Federation, the Fruit and Vegetable Canners' Association of Great Britain, the Tin Research Institute and the Tinplate Conference (1925) are taking part in celebrations this year of the granting of the patent. Arrangements include central and touring exhibitions of historic and modern cans with a strong emphasis on the progress of the industry from the earliest equipment to the most modern techniques of mechanisation and automation.

It is hoped to mark permanently a site in Southwark Park Road, London, where Bryan Donkin, F.R.S., put into production the world's first canned food factory, under Durand's original patent, and the search is continuing for any surviving descendants of Durand.



Part of the corrosion-resisting properties of tin is seen in these early examples of tin canning. The food inside was in surprisingly good condition when the cans were opened.

The patent

Peter Durand's original patent reads as follows:

A.D. 1810 **No. 3372**

PRESERVING ANIMAL AND VEGETABLE FOODS DURAND'S SPECIFICATION

NOW KNOW YE that in compliance with the said proviso, I, the said Peter Durand, do hereby declare that the nature of the said Invention, and the manner in which the same is to be performed and . . . that is to say:

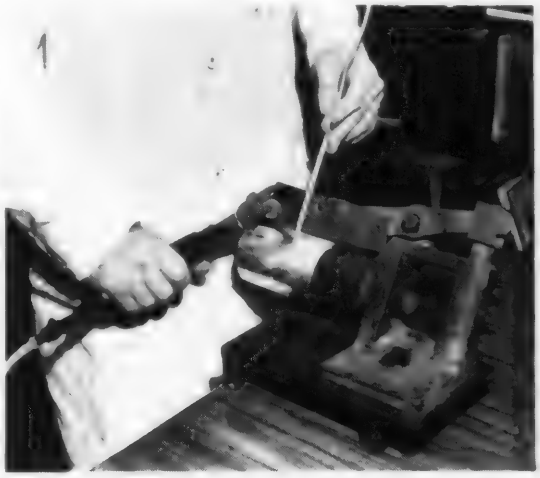
First I place and enclose the said food or articles in bottles or other vessels of glass, pottery, tin or other

metals of fit materials; and I do close the aperture of such containing vessels so as compleatly to cutt off and exclude all communication with the external air . . . and I . . . cover the vessel with cold water, which I gradually heat to boiling, and continue ebbulition for a certain time . . . The food or other articles thus prepared may be kept for a very long time in a state fit for use, care being taken that the vessel shall not be opened until the said contents shall be wanted for consumption.

However, the principles of the method of preserving fresh food by the action of heat alone were discovered by a French cook, Nicholas Appert, using glass bottles.

Durand's patent rights apparently were sold to Bryan Donkin, who had a factory in Blue Anchor Lane, Bermondsey, where the first sealed cans of food were produced. The Admiralty became one of Donkin's best customers and in 1824 Captain W. E. Parry was supplied with about 10,000 cans as the main part of the provisions of H.M.S. *Fury* and *Hecla* for the fourth voyage in search of the North West Passage.

Beer cans are lacquered internally twice, once as sheets of tinplate and a second time after they have been made up. Here they are seen coming from the drying oven, after their second lacquering, at Westhoughton, Lancs. (*By courtesy of The Metal Box Co., Ltd.*)



The contrast between the early production methods and the automatic processes of today is shown by comparing the photo above with the one on the right, which shows a can being made the 1898 way. The rolled tinplate is held in position by the "horse" while the side-seam is hand-soldered. (*By courtesy of Crosse and Blackwell, Ltd.*)

Free from rust

Fury was wrecked in August, 1825, and her stores were left near Melville Sound. Eight years later, these cans were found by Captain John Ross who was in dire straits after being held prisoner in the ice for three years.

"The canisters had been piled in two heaps . . . they had not suffered from rust."—*Voyage of Discovery in Search of the North West Passage, 1829 to 1833*, by Sir John Ross.

The firm of Donkin, Hall and Gamble was purchased in 1864 by Crosse and Blackwell, Ltd., of Soho Square, and, though records up to the end of the last century are somewhat scant, one of the can-makers employed there recalls that the tinsmiths, who were supplied with sheets of tinplate—ready cut and rolled to the shape of the cans—had to apply solder to the side seam of each sheet while it was held in position on a "horse." Removing it, the tinsmith then soldered on a plain disc for the bottom and another disc, this time with a hole the size of a florin, for the top.

Immediately after being filled, a disc known as a "stud" was soldered to close the hole in the lid. This stud in turn had a tiny hole in it, and before this was "brogged" with a blob of solder the can was steamed for a time to expel some of the remaining air.

Cans continued to be made by hand until the 1920s, when the first machine for closing cans was installed at Soho Square. In the early days the cans were made of very stout tinplate. Now the coating on 99 lb. of steel uses about 1 lb. of tin. Another contrast is that 25 years ago tinplate could be made only in small squares, less than a yard in length and in width, but today it is produced in coils over a yard wide and over two miles in length.

Five-ton quantities of steel are rolled into thick strip ($\frac{1}{8}$ in.) and wound into a coil. The coiled strip is annealed to restore ductility and then plated with tin on both sides while passing through electroplating baths at about 8 m.p.h. The tin coating is momentarily fused to brighten it and render it fully solderable.

"FOOD MANUFACTURE'S"

GUIDE TO

CANNING MACHINERY

In spite of the great advances made in recent years by other methods of food preservation, canning remains the most important of all methods. Indeed, it is still growing at a remarkable rate, and last year alone no less than £300 million was spent by the British consumer on canned food. New machines and improved canning methods are constantly coming on to the market, and this article briefly describes some of these.

Fruit and vegetable preparation

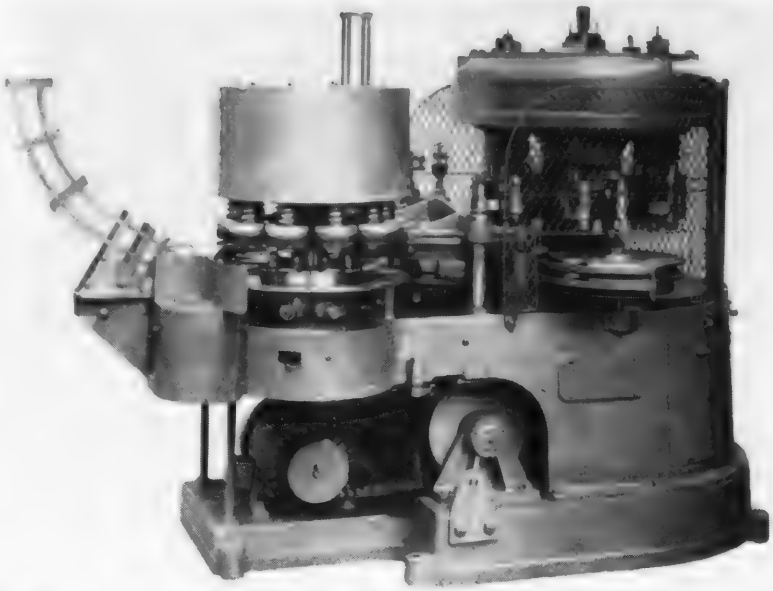
BEFORE fruit and vegetables are canned they must be prepared by slicing, peeling, snibbing, dicing, etc., and a firm which has made this sort of machinery for many years is William Brierley, Collier, and Hartley, Ltd., who make a large variety of fruit and vegetable handling and preserving equipment. Among recently introduced machines is the onion peeler, which was described in our November, 1959, issue, p. 449. Another machine is a continuous peeler, which has an output of 2 tons per hr., and can deal with carrots, turnips, parsnips, beetroot, rhubarb, and pineapples; a model with multiple feed hopper and feed tray has an output of ½ ton per hr. Also included in this firm's standard products are bean and celery cutting machines which can be used for other fruit and vegetables as well, slicing and dicing machines, an apple peeler and corer, and steam-jacketed pans of all kinds for boiling and sterilising. Pulping and sieving machines made by this firm are useful in the preparation of purées.

Canned meat

Most canned meats consumed in this country are imported from abroad from countries where meat is more expensive than in this country. In view of this, it is surprising that more meat, sausages, etc., is not canned in this country. Perhaps one of the reasons is that the preparation of sausages and similar speciality meat products demands "know-how" which is perhaps not so widely available in this country as in certain countries abroad, notably central Europe.

A firm which specialises in the provision of "know-how" in the cooked and canned meats field is Foodtech, Ltd., who also supply a number of machines useful in this field. One of the latest of these is the Hilgeland-Rohwer *Sausage Master*, which was described in our April issue, p. 168. The firm also supplies other machines for

(*Above*): **The Metal Box Co.'s "Tornado" can dryer.**



The Premier Filterpress Co.'s high speed fully automatic liquid gravity filler and double seaming machine.

cutting meat, such as a frozen meat cutter, which is able to cut 6 to 9 tons per hr. of all kinds of frozen meat and fat, a meat dicer useful for fresh cooked meat or frozen meat (this machine can also be used for vegetables), mixing machines with variable speed cutters, and a continuous vacuum stuffer and portioner which eliminates the need for a vacuum mixer and delivers exact portions for round or square tins in the range from 3 oz. to 14 lb. In addition to these machines, the firm can supply various recipes for all manner of canned meat products.

Vegetable canning equipment

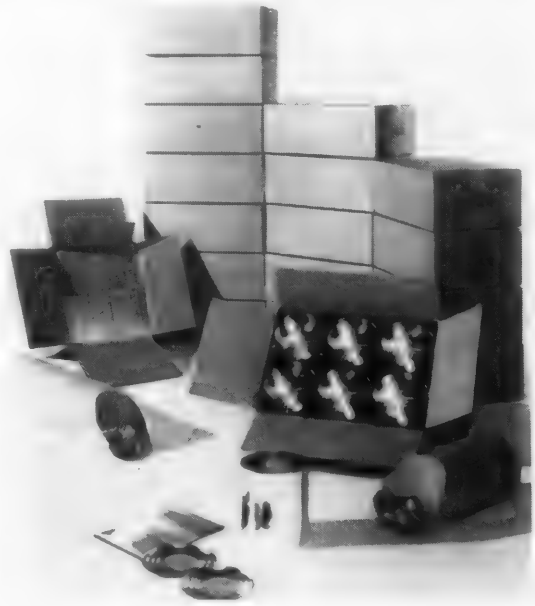
Numerous machines useful in the vegetable canning field are supplied by W. J. Hart and Sons (London), Ltd. They include the following: a tenderometer which determines the tenderness of peas and other similar products to a high degree of accuracy, a texturemeter for recording the state of maturity of peas, which can be taken out into the field to make tests on a growing crop, a fieldsman's pea shelling machine which can be taken into the field to prepare peas for testing with the two previous machines, a can opener and mincer with which one operator can open, drain, and rinse 6 size 10 cans per min., a hydraulic crate loader and unloader, a *Nu-Way* tractor-drawn spinach harvester, and a bean snibber. Other machines made by the same firm are the *Hydrout*, which is a water-powered trimming machine to deal with various products, models of which are available for pears, tomatoes, onions, apples, brussels sprouts, etc.; the capacity ranges from 210 to 700 lb. per hr. A bean cutter, bean slicer, pea cleaning machine, flotation washer, broad bean podder, spinach washer, cherry stemmer, cherry stoners, fruit washers, and juice extractors are all made by this firm, who have a range of mushroom equipment.

Hot air steriliser

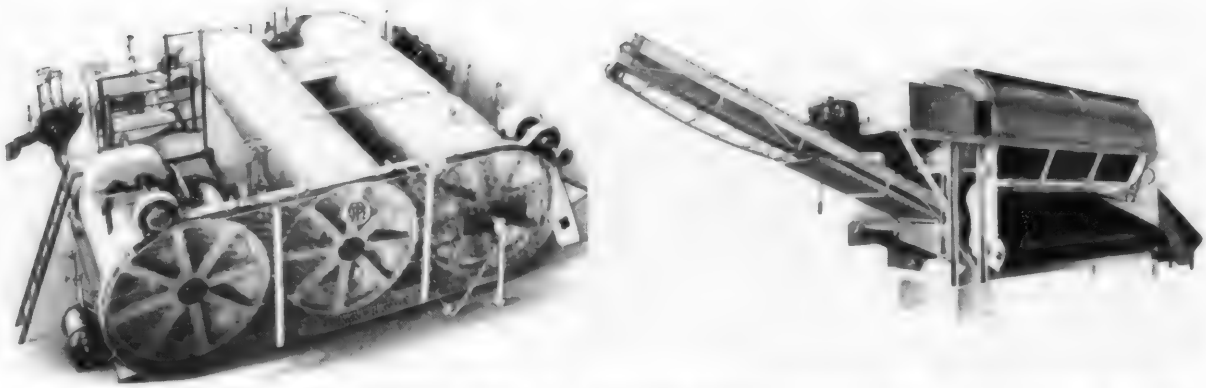
A. Johnson (London), Ltd., are developing a continuous cooker in which the cans are heated by hot air at atmospheric pressure. The system is said to have many mechanical advantages, inasmuch as no inlet and outlet transfer valves are employed. Cans are fed on to an elevator conveyor, split into lanes and fed into the cooker at not less than 160°F. In the cooker the cans are brought up to 250°F. by means of hot air passing over them at high speed. The air temperature is automatically regulated and the cooking time is controlled by varying the track speed through the machine, which can be heated electrically, by gas, or oil-fired heat exchangers, or finned type steam batteries. All sizes of cans up to 301 mm. diameter can be processed without any mechanical adjustment of the machine.

Coding machine

A fully automatic unit, the *Automatic Coder*, has been de-



A striking demonstration of the saving in space for export afforded by the use of the Metal Box Co.'s flattened cans. On the right are 17 cases of A.10 cans and on the left the same number of flattened can bodies with a parcel of ends. In the foreground is a flattened body with two ends, and the same type of body reformed ready for flanging and seaming.



Mather and Platt machines. (*Left*): **The rotary steriliser, for cooking fresh and processed peas, soups, beans in tomato sauce, etc., at speeds up to 400 c.p.m.** (*Right*): **The Mark XII super pea viner which incorporates every adjustment necessary for operating under a wide variety of conditions.**

signed by the Lerner Machine Co., Ltd., to print code on to any rigid surface. Although particularly designed for cans, it can also be used on cartons, etc., and, the makers say, will operate to code on the tops, bottoms, or sides of containers. Easily changed rubber type is used, which is re-inked with every stroke, and the printing head is designed to allow for a variation in the height of the container to be printed.

Vining machines

Harvesting and vining machines are among the large range of canning equipment made by Mather and Platt, Ltd. Their mobile pea harvester ,is claimed to produce clean peas under any conditions of weed and weather, and the firm say that this machine has produced over 2,000 lb. of shelled peas in one hour, and can cut over two acres per hr. Another vining machine is the *Mark XII Super Viner*, which has a normal output between 4 and 7½ tons per hr., depending on conditions, and which is readily adaptable for electric motor, petrol, or diesel drive.

Other machines made by the same firm useful in the canning field are the *J.C.B. Vertical Packer* for packing cans, etc., into wooden or metal crates, fibreboard cases, and trays; a twin-head filling machine which can fill a wide range of solids and liquids into cans either separately or in combination; the *Carvallo* cooker, which is manufactured in collaboration with the French inventor of this sterilising system and which can sterilise 400 cans per min. at 260°F. in a 40-min. sterilising period; and a non-adjustable can packer.

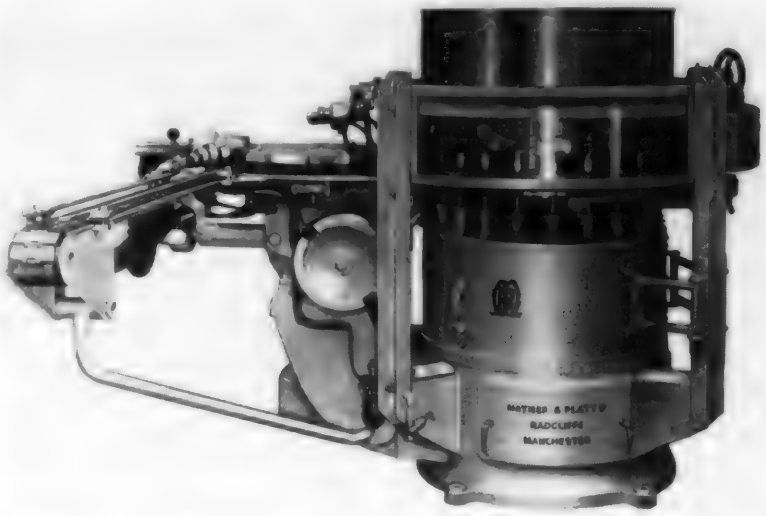
Can forming machinery

Among firms which make a comprehensive range of machines for can forming as well as those for filling and handling cans is the Metal Box Company, Ltd.

The differential double seamer made by this company has been specifically designed as a high-speed closing machine embodying a new fundamental approach to the problem of seaming at really high speeds. The adoption of this new principle is said to have the advantage of eliminating or minimising the more detrimental features of the traditional approach. Provision has been made to provide sufficient power transmission for up to 1,500 cans per min. and speeds of 750 cans per min. have been attained in preliminary trials.

The same firm's 24 C.T.V. is a new vacuum seamer which will be especially useful to the smaller canners. It is recommended for closing flat piecans, and it is claimed to be a particularly safe, trustworthy machine for semi-automatic closing. There is also another model, the 24 C.T. which does not draw a vacuum.

The company also makes a

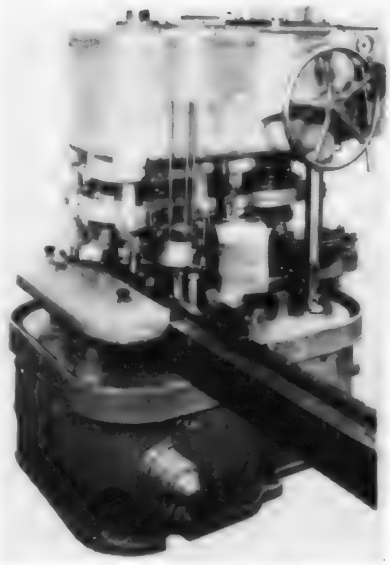


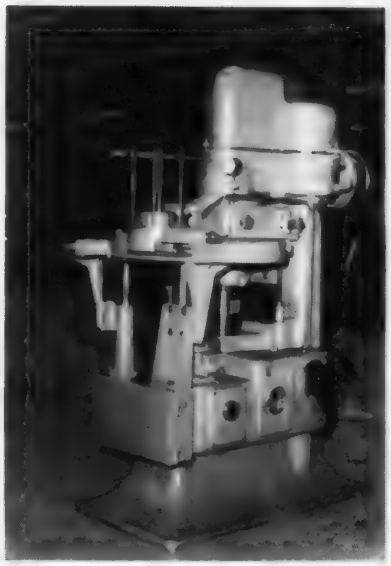
Mather and Platt's 20-station high speed universal filler, for speeds up to over 600 c.p.m.

comprehensive range of equipment for can handling, including equipment to relieve track pressure on cable conveyors, thus minimising damage to end seams.

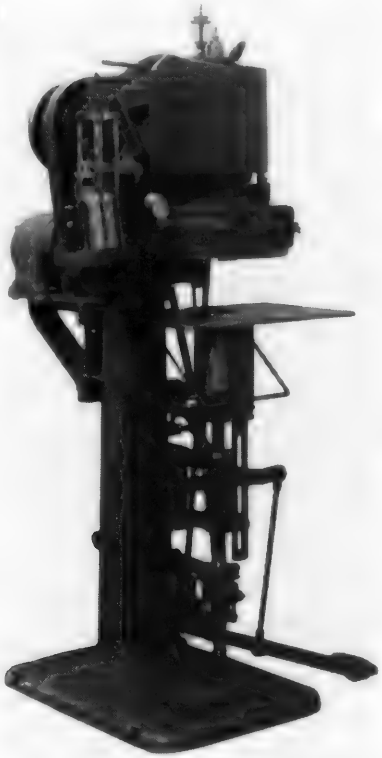
In order to prevent contamination of the runways on lines which handle filled cans, can dryers are coming into use to an increasing extent. Metal Box are marketing an air-blast dryer known as the *Tornado*, which dries the cans on the conventional cable runways at speeds of up to 400 per min., and they have also developed a rotating can drier for speeds of up to 220 per min., which will operate either horizontally or as an inclined elevator.

For export overseas to countries which do not yet make their own cans Metal Box provides flattened cans which are sent out with both ends detached and simple machinery for reforming, flanging, and seaming on the ends. This method is claimed to give economy in shipping space and a great saving in freight charges, as 17 cases of filled cans occupy the same space as one case containing the same number of flattened can bodies.

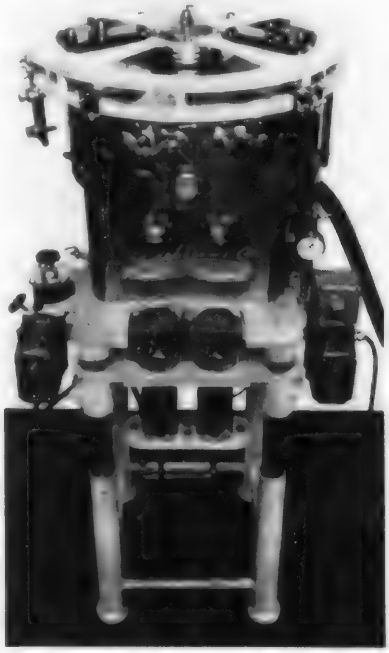




(*Left*): **The Metal Box Co.'s differential double seaming machine.** (*Right*): **Metal Box's new 24 C.T.V. vacuum seamer.**



A semi-automatic vacuumising and double-seaming machine by the Premier Filterpress Co.



Meyer "Dumore" two-valve can filler.

Canning of beverages

The makers of the Meyer-Dumore flat top can filler, Meyer Liquid, Ltd., produce several models which give outputs from 60 to 900 cans per min. More recently, they have produced a small semi-automatic 2-valve can filler to give an output of approximately 12 cans per min., as an experimental machine for the small bottler who may wish to start canning for the first time, or who has a low, but steady, demand for canned beverages.

Can closing machines

The Premier Filterpress Co. manufacture high-speed and vacuum can closing machinery. Their Model N.16 seaming machine is of the four-head turret type and is capable of speeds up to 250 cans per min. A 10-head liquid gravity filler can be mounted on the first feed disc of the seamer and this can be used for filling soups, milk, fruit juices, etc., or for adding liquids to cans of vegetables and fruit, etc. If the liquid is filled at almost boiling point a comparatively high vacuum is obtained in the closed cans as it is only a matter of seconds between filling and closure. The filler forms an integral part of the seamer.

The company also manufacture vacuum can closing machines, and when using these the only other processing required is sterilisation of the closed cans. These machines are suitable for fish and meat as well as fruit, vegetables,

(*Concluded on page* 350)

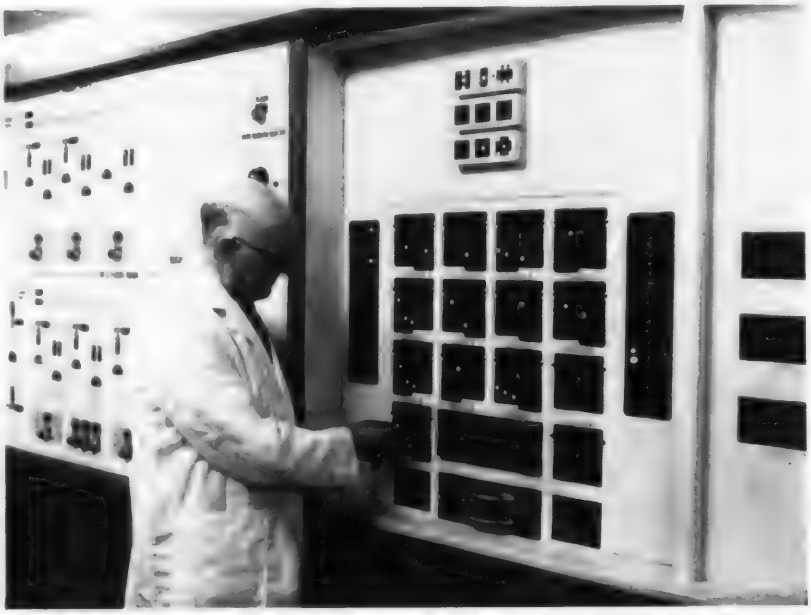
Carr's New Handling Plant

Biscuits produced automatically by punched card system

Carr and Co. have recently installed a fully automatic handling and processing plant at their Carlisle factory which provides full automation in the manufacture of biscuits. This article gives technical details.

WHAT is claimed to be the most modern plant of its type in the world will shortly be in full commission at the Carlisle factory of Carr and Co., Ltd., biscuit manufacturers. The main advance lies in the field of handling of raw and processed ingredients when received at the factory, and the subsequent control during conveyance to the mixers and during delivery of the dough to the ovens. Up to now, Carrs have depended largely on manual handling, but the new installation is designed to provide full automation in the manufacture of their biscuits.

Mechanisation begins at the bulk delivery points for flour, glucose syrup, and sugar, which are delivered in road tankers. Basis of the system of automation is the punched recipe card, which, inserted into the master control panel, calls for, obtains, and deals with the exact quantity of flour required for any particular line of biscuit. In addition, a series of digital controls are pre-set for the required amounts of fat, syrup, and glucose.



Mr. Jack Sharp, panel controller, is seen plugging a special recipe into the recipe card section of the master control panel. The panel is controlling the delivery of flour and the " domino " indicator at the top is repeating the weight of flour delivered at that moment (39·6 stones) to no. 15 oven.

Flour handling plant

The plant has been designed for the intake of different types of flour, either in bag or in bulk; sample testing of the flour after delivery to either of two test bins and easy return of rejected deliveries; storage in different bins and blending, weighing, and delivery of requested batches to the dough mixers feeding the production lines, and for some precautionary treatment of the flour delivered to the plant.

Overall operation is from a main control panel, which incorporates a punched card system and print-out facilities to record the day's work. The operation of the plant can be controlled either by completely automatic functioning of the control panel, or a semi-automatic operation allowing for particular section close downs. Provision has also been made for fitting motor start-ups under test conditions from the Control Room.

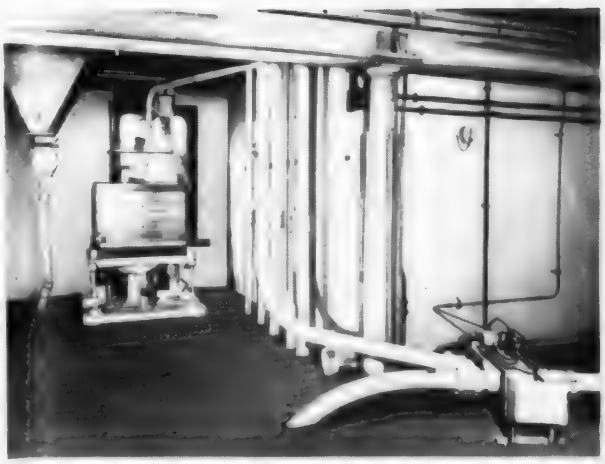
The plant has been tailor-made to Carr's particular requirements in close liaison with their own engineering department, and was designed to fit compactly into buildings which were largely existing.

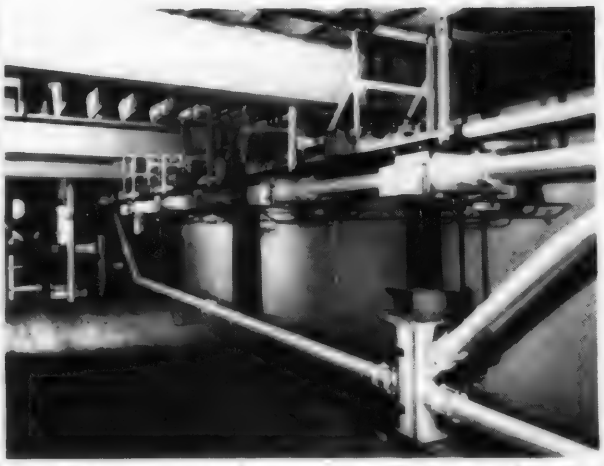
Intake

Two separate intake points from bulk vehicles are provided at ground floor level in the building which houses the test bins and main storage bins, allowing intake from each vehicle at the rate of 18 tons/hr. One vehicle can be discharged while a second vehicle is manœuvred into position and coupled up. Vehicles can be discharged by their own engine-powered blowing units, but a land-based blowing unit has been provided for normal use to minimise noise, and for discharging vehicles not fitted with their own compressors.

A sack intake unit is provided as an alternative. It incorporates an efficient dust collector, and is intended for handling flour in sacks from the granary floor at the rate of 5 tons/hr. All this flour then passes through an entoleter which destroys any non-virus living organisms.

Two test bins, each capable of accepting a full vehicle of some 15 tons, are provided. One of these can be emptied while the other is being filled.





(Left): **The " Minisifter " in which flour is dressed before passing to the appropriate main storage bin. The hopper of the dust collector can be seen immediately on the left, and the pipeline in the foreground is the main conveying line carrying flour from the storage bins to the dough mixers. The diverter valve at this point clears the line between deliveries.** *(Right)*: **The return line to the main storage bins with the load cell weigher at the end of the section. Each diverter valve is automatically switched to the correct position to allow surplus flour in the line after each weighing to be automatically returned to the bin of origin.**

If samples taken from the test bins are rejected, the contents of the bin are returned to the bulk lorry, or for re-sacking, by a return blowing line.

Flour distribution

Seven main storage bins, each 47 ft. high with a capacity of 31 tons, have been installed in the existing granary building. Flour from the test bins is re-dressed on a *Minisifter* before being blown into the specified storage bin. Choice of bin is made possible by remotely controlled pneumatically operated diverter valves which divert the flour from the main conveying line into the specified bin.

One of the Baker Perkins high-speed tilting bowl mixers, which is fed with flour from the hopper on the left and with other ingredients from the sifter unit on the right. The air-conditioning ducting can be seen above the tiled surround.

Four main operations are carried out in this part of the plant, all of which are controlled from the central panel. They are: delivery of flour from either test bin to any of the main storage bins; delivery of flour from a test bin to a bagging point for dusting flour; delivery of flour from a test bin to a reject bagging point; or back to a bulk vehicle.

A switch on the main control panel enables the controller to select the operation required. By pressing the starter button on the required test bin, reproduced in mimic form on the panel, the correct delivery route is automatically set up and the necessary motors started in correct order.

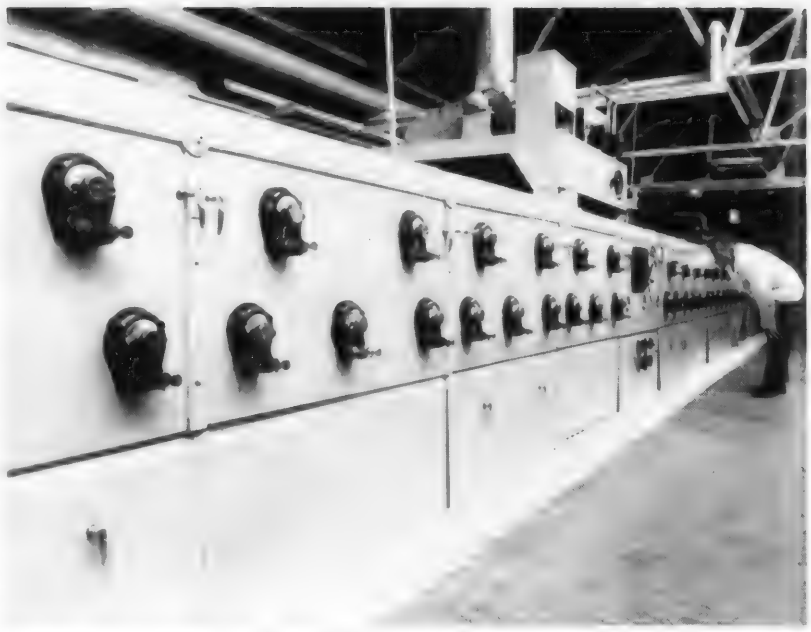
A pressure switch in the conveying line from the test bins actuates a light on the panel when flour is flowing in the line. The controller then releases the start button and the operation continues automatically. Various local controls are provided for use in particular circumstances and, as with other sections of the plant, the distribution section is fully interlocked so that, for example, the start button will be inoperative if a full main bin is selected, or if the correct route is not set up.

A special arrangement of solenoid-operated air valves is installed to prevent arching of the

flour in any of the bins. Bin level indicators, fitted at three points on each bin, automatically bring about the introduction of compressed air to break down any arch of flour which might occur and at the same time give remote indication of the level of flour in the bin.

The bins are discharged by twin worm bin dischargers, which feed the flour into intermediate hoppers. The hoppers are mounted directly above blow line rotary feeders, specially designed to feed powdered materials into pressure conveying lines without excessive loss of the conveying air.

Selective conveying of flour from the bins to the batch weigher is made possible by electro-pneumatic diverter valves, which are inserted at appropriate points in the conveying line.



Oven supervisor Mr. Norman Gibson is examining one of the burners on a 232 ft. long band oven. Immediately in front of him there is a dial thermometer and an inspection door through which he can see the biscuits.

Batch weighing

The batch weighing bin is mounted on load cells and will weigh batches up to a maximum of 800 lb. Each batch can consist of various weights of up to seven different types of flour automatically selected from the main storage bins. The weight of each particular flour is pre-selected by punched cards and, as soon as this selected weight is reached, a diverter valve immediately prior to the weigh bin is automatically switched over. The wheel valve below the storage bin from which flour is being taken is automatically stopped, but the blower continues to run. Flour which remains in the conveyor line is thus diverted into a return line which carries it back to the bin of origin. This process can be automatically repeated up to seven times depending on the desired recipe of the final batch.

The requested batch of flour in the weigher is now discharged into a distribution hopper immediately below via an electro-pneumatic bin discharger slide. A rotary feeder at the base of this hopper feeds the batch conveying line, which distributes flour to the dough mixers located at different points in the biscuit factory.

The weight of each particular flour is given on an indicator on the control panel, and the recipes of batches required are selected automatically by means of a punched card system, which enables the oven operator to request a batch to the recipe of his particular oven, or it can be selected manually by the controller.

Batch distribution

The weighed batches of flour are delivered to receivers mounted above dough mixers located in two main mixing rooms. Each receiver incorporates its own dust collector unit and is discharged by an electro-pneumatic bin discharger.

The correct distribution path for feeding a weighed batch to a receiver is determined by the automatic programmer involving the punch card system. A manually selected recipe can be distributed by a simple selector switch and starter button on the control panel.

Delivery of batches to the dough mixers is at either the request of the oven operators or the operation of semi-random selection equipment built into the programming unit. A local indicator informs the oven operator when a batch has been delivered, and by pressing a discharge button he delivers the batch to the mixer.

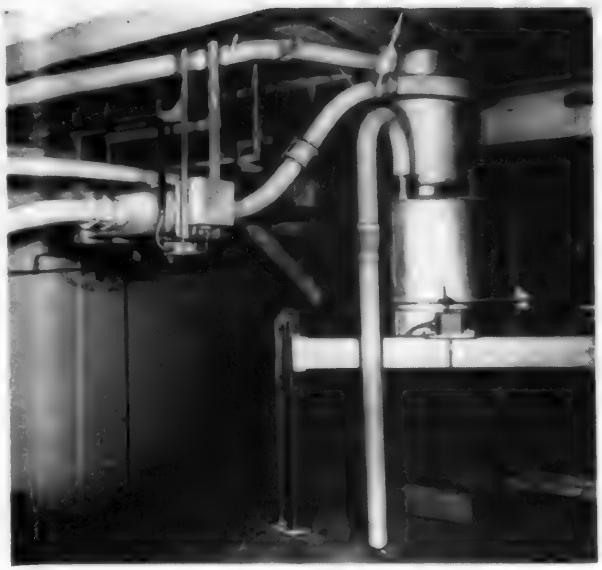
The type of batch delivered to receivers is governed by punched recipe cards, and overall control of the sequence of deliveries is again the province of the main controller.

Recipe programming

A recipe consists of a blend of any of seven grades of flour with the possible addition of milled and granulated sugar. Fats, syrups, glucose, and other ingredients are added during mixing.

Selection and control of recipes can be carried out in either of two ways: a manually programmed system, and a pre-programmed system using punched cards which gives fully automatic operation.

Holes punched in each recipe card correspond to the weight of each ingredient required. Plugs inserted through each hole into corresponding holes in the programme panel interconnect two printed circuit matrices, so selecting the type and weight of ingredient required. Pre-punched cards are supplied for special mixes, and a spare programme position enables these to be set up without disturbing normal working.



The weigh bin which is mounted on Elliott load cells. Batches of different types of flour from the storage bins are weighed here before distribution to the dough mixers feeding the ovens. The diverter valve in the foreground cuts off the feed when the pre - set batch weight is reached and returns flour in the line to the bin of origin.

A request for a mix from an oven operator actuates the programmer which selects the correct recipe for that oven, and initiates the conveyance of each ingredient to a receiver above the mixer. Where more than one oven uses the same mixer, separate panels are provided for each oven. This enables these ovens to be supplied with different recipes, and signals are exclusive to the oven requesting the mix.

Requests for mixes can be answered by the programmer directly, which selects the recipe by scanning the ovens in a semi-random fashion. Alternatively, where requests are required to be dealt with in a particular order, the main controller can decide which oven will be supplied next. This facility is particularly necessary at the commencement of a day's work when a large number of requests may be received at the same time.

With the pre-programmed system, where more than one mix has been requested at the same time, the programmer scans all the ovens in a pre-determined order until it finds one making a request. The weighing of this mix is completed and dispatched before the hunting for another request is started.

The programmer will omit any request from an oven whose containers already hold ingredients or have their discharge valves open. It will also reject a recipe requiring an ingredient that is not available. The scanner gives preferential treatment to the more important lines of production.

Automatic recording

A complete record of the ovens selected and the recipes supplied is given by a teleprinter of standard pattern installed in an alcove adjacent to the control panel. The recipe is printed with letter prefixes before each weight, denoting the grade and type of each ingredient used. The weights printed are accumulative for each ingredient, and this provides an immediate stock check on total weights.

Control panel

The control panel is housed in a specially constructed dust-free room. Starters and subsidiary control equipment are grouped in a separate compartment at the rear of the panel.

A small desk projection at the centre of the panel contains the controls of an intercommunication system, which links the main controller with all the remote control points.

The panel is divided into appropriate sections covering intake to test bins, transfer from test bins to storage bins, batch preparation, and batch distribution. It gives a practical diagrammatic layout of the Robinson plant to which the controls have been applied.

Some thirty motors of English Electric manufacture have been installed in the plant, ranging from $\frac{3}{4}$ h.p. to 25 h.p. All are controlled from the main panel.

Six large cabinets at the rear of the control panel house the motor starters, relays and fuse gear, and provide circuit protection and facilities for sectional isolation for maintenance.

The equipment includes nearly 200 relays and approximately 80 miles of panel and unit interconnecting wiring.

Some 80 heavy duty micro switches are used on the diverter valves and electro - pneumatic slides to transmit the necessary signals.

The Tyler flour bins combine the advantages of timber for flour storage, including high insulation and freedom from condensation, with the sturdiness of a reinforced concrete framework. Steel hoppers are mounted beneath.

SOME SUPPLIERS OF EQUIPMENT

Baker Perkins, Ltd.: dough handling machinery.

Elliott Bros. (London), Ltd.: control panel, instrumentation and weighing cells.

Thomas Robinson and Co., Ltd.: bulk flour handling plant.

A diverter valve feeding a receiver which delivers batches of flour to the dough mixing plant.

New Czech Continuous Butter Churn

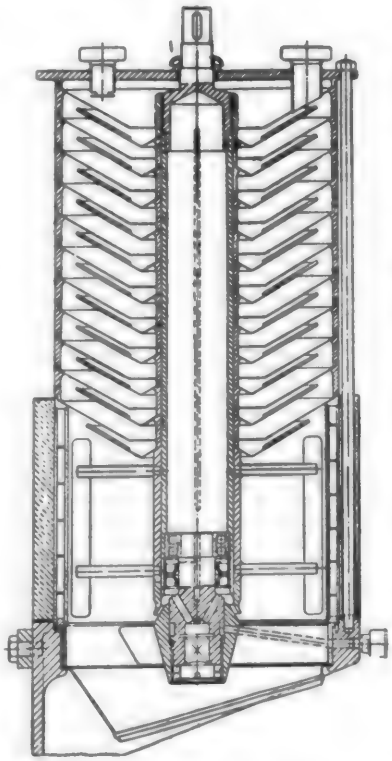
THE design and development of continuous butter making machinery has, in general, been approached from two directions, to churn butter on the mechanical principle, or to produce "plastic cream" by obtaining 80% butter fat from warm cream centrifuged and subsequently cooled. Butter made by the latter method is, however, inferior in quality and has not found much favour with the public. Most designers have, therefore, concentrated on solving the problem of continuous butter making on the mechanical principle, using the same technological process of churning as in traditional churns.

The Czechoslovak Research Institute for Refrigeration and Food Engineering has followed this path in evolving a continuous butter making machine which will, morever, handle sour cream as well. Tests with a prototype unit have given good results, it is stated, and a standard machine has now gone into production. The design and method are protected by three Czechoslovak and 12 foreign patents.

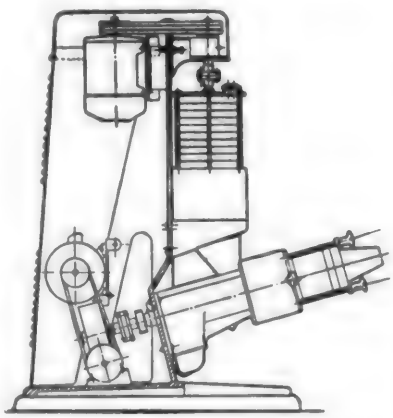
The main components are a churning cylinder, kneading mechanism, motor, equalising tank, feed mechanism and control valve. The housing of the machinery may also take refrigeration equipment of 4,000 kcal. h. capacity with direct freon evaporation, using a 2·2 kW. electric power drive. The diagrams show the general cross section of the machine and a cross section of the churning cylinder.

The cylinder is 300 mm. in diameter and its lower part is cooled by brine; parts of the kneading mechanism, a system of worm screws, are also brine cooled. The cylinder carries a shaft with churning discs spaced at equal distances. Into these discs engage fixed discs on the cylinder wall; they have the same shape and spacing and, with the others, form gaps through which cream is worked. The rotating discs have churning blades.

Successful churning is assured by both the spacing between the discs and the working speed being adjustable. The cream is fed by gravity over the top fixed discs and thence to the top rotating discs. It is thrown towards the circumference by centrifugal force and, simultaneously, churned intensively by the blades. In this way it travels downwards, from disc to disc, until it reaches the lowest part of the cylinder.



A general cross section of the continuous butter churn.



A cross section of the churning cylinder.

The cream is foamed among the upper discs, fat globules agglomerate among the middle and butter grain and buttermilk are formed among the lower. Thick grain and buttermilk finally pass through the very lowest, chilled part of the cylinder where a four blade stirrer carries the butter grains off the wall of the cylinder. A mixture of butter grains and buttermilk falls into the buttermilk collecting tank and is there kneaded and moved on by a pair of worm screws.

The butter grains are thus carried to the kneader proper in a pre-cooled state. This kneader consists of one kneading and two mixing chambers, divided by sieves with a 2 mm. mesh. The finished butter emerges from the last mixing chamber at a temperature of 13°C. on to a conveyor which takes it to the packing machines.

This new butter churn has an output of 400 kg. per hour when the supply of cream to the churning cylinder is 800 litres with a 42% butter fat content. The output will naturally vary with the fat content. During tests, the machine produced over 500 kg. of butter an hour without strain on the mechanism—an apparently satisfactory proof of capacity and robustness.—B. ORNA.

Notes for Contributors

The Editor of FOOD MANUFACTURE welcomes articles, news items and other contributions on all aspects of food production.

A preliminary synopsis should, preferably, be sent to the Editor, and the contribution itself should be typed in double spacing on one side of the paper only. It should bear the name and address of the author and should be accompanied by photographs suitable for illustrations.

Desiccated Coconut—Facts and Figures

SIR,

We have read with some surprise your article on desiccated coconut which appeared in your June number of FOOD MANUFACTURE.

We do not know the source of your information, but we feel that the picture given is inaccurate and misleading in many respects and does less than justice to the efforts that are being made in Ceylon to get over this difficult problem.

As our company is quite a substantial importer of desiccated coconut, we have naturally been very concerned about what has happened, and two months ago one of our directors went out there with the express purpose of impressing on the millers the seriousness of the situation over here and to make recommendations on action that should be taken. Your correspondent pictures the Ceylon millers as indifferent and indolent, but nothing could be further from the truth. The more responsible millers—and there are many of them—are very apprehensive indeed about what has happened to some of their shipments. They are fully alive to the danger to their industry, and they are only too willing to put into operation any measures that will overcome this problem.

Of course, the Ceylon coconut industry is backward by Western standards, since they lack both capital and labour who are accustomed to working under hygienic conditions. However, with the help of some of the more enlightened Ceylon exporters and the Ceylon Institute of Scientific and Industrial Research, they are making efforts to modernise their production, and we expect that the improvement will begin to give positive results by next autumn.

We believe that the figure of 19% which you quote as the proportion of condemnations is much too high, and there are signs that there is aleady an improvement in the situation. We would estimate that the total amount of condemnations amounts to less than 2% since the trouble first arose last December.

We enclose herewith a copy of a report which our director made on his return from Ceylon which you may find of interest. We should be very much obliged if you could publish some rectification of some of the most alarmist and misleading information given in your June number.

D. TOFT,
Director,
T. M. Duché and Sons
(U.K.), Ltd.

SIR,

In the interest of everyone interested in desiccated coconut, I feel I must correct the erroneous statement made in the June edition, that:

"Salmonella 19% of all imports condemned as unfit for consumption."

This trouble first came to light in December, 1959, and during the past 6 months I should estimate that the total amount condemned is at most 5 to 6% of the total quantity landed during those 6 months.

Furthermore, the general state has so improved that the great majority of the parcels recently landed have been passed and the number of condemned parcels is now probably about 1 to 2% if that.

These figures can be checked by consulting the P.H.A. at the various ports and the Guildhall in London. Already steps have been taken in Ceylon to see that the risk of contamination is reduced, and there are now parcels arriving in the U.K. which have been obtained from mills where the utmost care has been taken. The subject of salmonella has been very closely watched by this Association; there having been meetings with the Ceylon Trade Commissioner, the Chairman of the Ceylon Coconut Board—also this Association has been in close touch with the Food Manufacturers Federation Incorporated—these meetings were held to do all possible to improve the Ceylon end and also to look after the interest of the consumers in the U.K.

E. W. P. DAVIES,
Chairman,
Desiccated Coconut Association,
15, Eastcheap,
London, E.C.3.

We have received from the Food Hygiene Laboratory of the Central Public Health Laboratory, Hendon, who have examined samples of most shipments of desiccated coconut imported into the London area, the following figures and percentages of samples examined and found to be positive for organisms of the salmonella group.

It is true that the figure of 19% (more precisely 18.6%) of infected material quoted in our editorial comment refers only to coconut flour in the period July, 1959, to March, 1960, nevertheless the figures from official sources show that in the same period 9% of all samples examined were infected and that the overall figure to date is 6.7%, much higher than the "less than 2%" estimated by our correspondent. These figures are published in the Monthly Bulletin for June of the Ministry of Health and Public Health Laboratory Service. We are firmly of the opinion that pressure should be brought to bear on the Ceylon Government to put out of business the producers of this infected material unless they radically alter their processing methods.—*Editor.*

	July 1959 to March 1960	*April 1960 to date*	*combined figures*
coconut flour	8/43(18·6%)	0/2	8/45(17·7%)
fine coconut	45/449(10·0%)	7/168(4·1%)	52/617(8·4%)
medium coconut	21/268(7·8%)	12/204(5·8%)	23/472(4·8%)
thread coconut	2/82(2·4%)	0/8	2/90(2·2%)
chippings and flakes	0/9	0/9	0/18
totals	76/851(9·0%)	19/389(4·8%)	85/1242(6·7%)

OBITER DICTA

● Eggs are not made in a factory. They are laid by hens.—*Egg Marketing Board advert.*

● Machine for disgorging champagne and dosing with liqueur.—*U.S.S.R. Patents Abstracts Journal.*

● I myself think that vanilla dairy ice takes a lot of licking.—*Miss Edith Pitt, Parliamentary Under Secretary to the Ministry of Health.*

● Bread is a courtesy title today. It is like white rubber, but seems to satisfy a depressingly large number of people.—*Cardiff magistrate, quoted in Bakers' Review.*

● I asked my neighbour why he never went to the Continent on holiday. He said: "Because my wife can't do without English tea, I can't do without draught bitter and the children don't want to miss their favourite TV. programmes." — *Daily Mirror, quoted in New Statesman.*

● Sprostons (Jamaica), Ltd., reports the sale of large quantities of aluminium roofing sheet specifically for covering poultry houses. Apparently, poultry mortality rate in Jamaica is 1% as against 5% in the U.S.A. It is unknown if this is all attributable to the roofing. — *Aluminium News.*

● Lip-licking is widely practised by child actors in television advertising films as a sign of a whetted appetite. I don't know if it ever happens, but the script-writers—who apparently keep inserting "lick lips" in the stage directions, obviously think so.—*Letter in The Times.*

● In addition, a policeman with a Geiger counter is to make quick tests of his (Mr. Khruschev's) victuals in case some ill-disposed scientist may have infected them with radioactivity. What is not yet clear is whether the policeman or the food-taster is to have first cut at these dishes.—*Daily Telegraph.*

● They say it's easy to make friends if you have a child or a dog. But if you're a business girl with neither, half a pound of freshly ground coffee is an excellent substitute. Take this with you to the nearest library, bookshop or department store, and within seconds someone will say: "What a lovely smell of coffee!" Conversation will follow quite easily.—*Woman's Own, quoted in New Statesman.*

Your Pest Problems

(*Concluded from page 320*)

species can eat through paper packing materials.

To summarise, therefore, in retail distribution the problems of the manufacturer differ from those of the retailer. The manufacturer's problems are:

1. to pack material in insect-free condition;
2. to decide whether to use an insect-proof pack. This is normally a question of economics. At the present time he has no insect or rodent repellent packing available to him as a practical commercial proposition.

With the retailer, however, the problems are to keep his premises clean, to turn over his stock in correct rotation, and to look for and take action against any rodents or insects which he may find.

Summary and conclusion

This article draws attention to the special problems in the storage of cereals, in particular to the storage of cereals in bulk. The problems are mainly associated with the difficulty of detecting the presence of insects in grain in bulk; with the phenomena of heating of grain in bulk and the consequent transfer of moisture. In the general warehouse the responsibilities of the warehouse keeper require him to provide a pest-free stowage and to protect goods from pests whilst in his charge. In retail distribution the manufacturer must be sure that his goods are free from insects when distributed; he must then decide whether to use an insect-proof pack.

The retailer, on the other hand, must not assume that packages are insect-proof. He must firstly observe good hygiene practice, then see that he does not have a resident population of insects or of rodents and take immediate action about any which he does find.

This article is based on a paper read by the author at a symposium organised by the Pesticides Group of the Society of Chemical Industry in co-operation with the Industrial Pest Control Association.

World Food Supplies–7

(*Concluded from page 320*)

monly presented and that some of the extreme statements published must be rejected on scientific grounds.

This does not mean that urgent action is not required on many fronts; all men of intelligence and goodwill desire to see the active promotion of programmes for the relief of poverty, undernutrition, and malnutrition in all countries, and especially in those most in need. Such programmes to be successful will require a co-operative effort of many nations and of groups within nations.

Within the British Commonwealth are many countries which require aid. Our record in the past in promoting progress overseas in agriculture, food technology, nutrition, medicine, and public health cannot lightly be ignored. Much has been done in recent years by groups such as those of Platt at the London School of Hygiene and by workers in the field, including those now attached to Medical or Agricultural Units at the newer overseas universities. But because of the magnitude of the problems involved and because of the necessity for rapid improvements, there is need for an increased effort in terms of both financial resources and personnel —and this will require a joint contribution from many quarters in Britain and not least from teaching and research institutes and from industry.

For the references denoted by numbers in the text see last month's issue.

▶ Negretti and Zambra, Ltd., have published up-to-date editions of their catalogues, *List G/45/1*, which gives details of their indicating, recording, vacuum, pressure and differential gauges, and *List H/20/2*, which covers their hygrometers.

▶ John Dale, Ltd., have issued a booklet concerning the activities of the packaging division of the firm. The firm specialises in collapsible metal tubes, with various internal coatings, rigid boxes and containers in tin and aluminium, aerosol containers and various plastic mouldings for packaging.

MACHINERY and EQUIPMENT

SELF-ADHESIVE LABELLING

The Cow and Gate organization have recently changed over from the use of pre-printed jars to a separate labelling operation for their "Farmer's Wife" Double Devon Cream.

The automatic jar labelling process now in use employs a moisture resistant self-adhesive vinyl transparent strip medium printed in red with brand name and trademark design. Thus the same effect as a printed jar is achieved, the label's outline being barely visible on the light coloured background of cream. It is claimed that a useful saving of cost is obtained with this system.

Printing of the label is by *Sheenshield* process developed by Gordon and Gotch (Sellotape), Ltd., in which the wording is printed under the surface of the vinyl film before the adhesive coating is applied. Thus complete protection is afforded to the message by the film itself. This form of labelling is claimed to be impervious to the condensation which easily forms when glass jars containing cream are removed from cool storage.

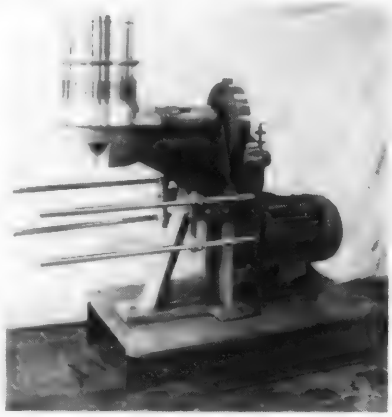
Photo electrical equipment is employed in cutting the tape to ensure exact length and printing registration of each label. This is obtained by a registration mark which is, in effect, part of the design.

The 1¼ in. wide self-adhesive label strip is drawn from a 360 yard roll specially wound to give even tension in draw-off and to minimise machine stoppages for replacement rolls. Before labels are applied to the jars, a coding device comes into operation enabling output to be batched. Throughput is approximately 36 jars per min. The machine was built by Wincanton Transport and Engineering Co., Ltd., and the printed self-adhesive labelling medium was supplied by Gordon and Gotch (Sellotape), Ltd.

This automatic labelling machine applies "Sellotape" moisture resistant, batch-coded brand labels to Cow and Gate cream jars. Correct registration and exact length is achieved by an "electronic eye."

NEW ROTARY GRANULATORS

A new range of granulators to deal with sticky or waxy materials which are difficult to handle in comminuting mills has been developed by Apex Construction, Ltd. Known as the no. 52, the new type of machine is claimed to produce firmer and stronger granules than those produced by any other method, as well as giving high production throughput. This granulator will also handle plastic materials including those of a waxy nature. The makers say that the 52 granulator has been successfully applied in the food industry for the production of products in a granulated form, including vitamised cocoa products, dog foods, etc.

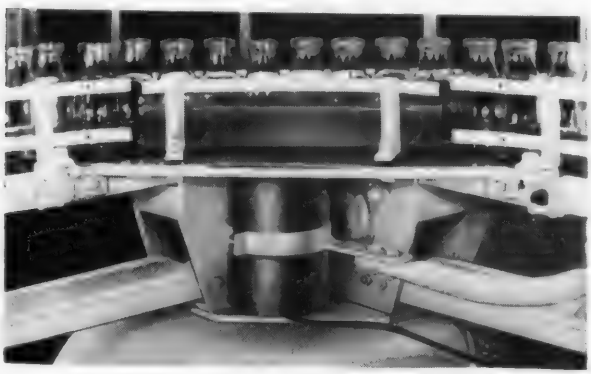


The no. 52 RB rotary granulator, one of a range recently introduced by Apex for handling sticky and waxy materials.

METAL DETECTOR FOR MILK BOTTLES

An addition to the range of detectors made by Metal Detection, Ltd., is the *Bottlescanner* which automatically detects metallic trash in milk bottles, e.g., milk bottle caps or fragments. Claimed to be the first of its kind, and consisting of a fully transistorised unit, it can be positioned at an appropriate spot in the washing process or at a stage prior to filling.

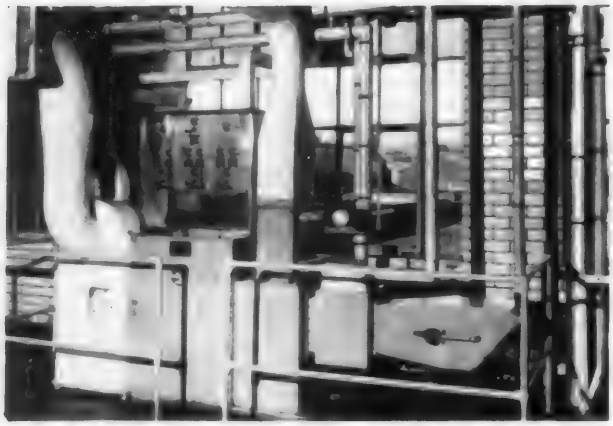
Audible warning is given of the presence of any contaminative metal particles.

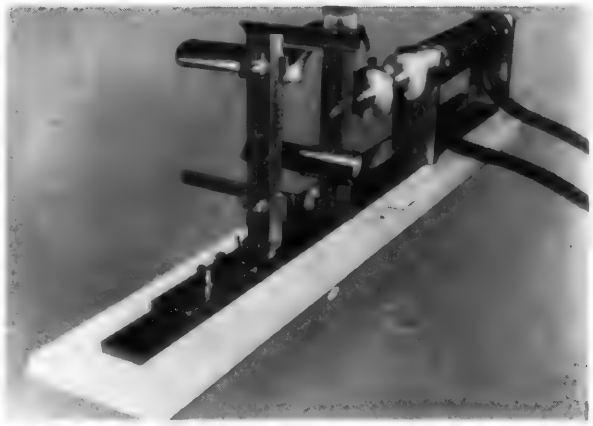


This "Bottlescanner" by Metal Detection, Ltd., gives audible warning of metal fragments in beverage bottles.

AIR CONDITIONING

Following a detailed investigation by the Production Study Department of Geo. Bassett and Co., Ltd., air conditioning plant and refrigeration equipment to the value of £10,000 was installed and so improved the cutting





(*Left*): **The Birlec direct dehumidifier, installed at the works of George Bassett and Co., Ltd., which supplies air at an outlet dewpoint of 10 F. to three conditioning tunnels.** (*Right*): **The new "Visten" pneumatic stuffer introduced by Viskase, Ltd., for packing bacon joints, chickens, hams, etc.**

and handling of confectionery products that 30% of the labour on the operation was saved, it is claimed. In addition, the capital outlay for the installation was recovered by the end of the first year of operation, based on labour costs savings alone.

The particular problem which beset Bassetts concerned the manufacture of liquorice allsorts of the "sandwich" type. The allsorts are made from rectangular sheets of liquorice and cream paste which are cut into strips, turned through 90° and cut again. The second cut, whilst being quite clean at the point of cutting resulted in the allsorts squares sticking together. Consequently many girls were required solely to separate the mass of squares. The trouble was worse in warm, humid weather so it was obvious that air conditioning of some description would be essential if the situation was to be rectified.

AEI-Birlec, Ltd., were called in and, jointly with Geo. Bassets, made several tests involving the use of a "conditioning tunnel" through which the material was carried after the first cutting. Success was soon evident for the allsorts, when moving from the second cut stage, readily fell apart and handling was made much easier.

Following final tests it was agreed that a Birlec CK direct dehumidifier would quite satisfactorily provide conditions in three conditioning tunnels so that a dewpoint of less than 10°F. in the cooling coils of the refrigeration sets was obtained. With a dry air delivery to each tunnel of 210 c.f.m. a recirculated air volume of 2,000 c.f.m. air at below 32° F. could be obtained without the formation of frost on the cooling coils or condensation on the sweets. The C.K. Direct Dehumidifier contains a number of beds of moisture adsorbent, in this case activated alumina, through which a stream of air is directed by automatic valves. Each bed is automatically reactivated by steam as the cycle is repeated, thus ensuring a continuous supply of dry air.

BAG STRETCHER

Viskase, Ltd., introduced last year *Visten* bags which have become established for the packaging of bacon boiling joints because of their clarity and self-shrinking intimate cling. They now offer the *Visten* pneumatic stuffer, which has adjustable fingers on to which, in the closed position a Visten bag of suitable size is placed.

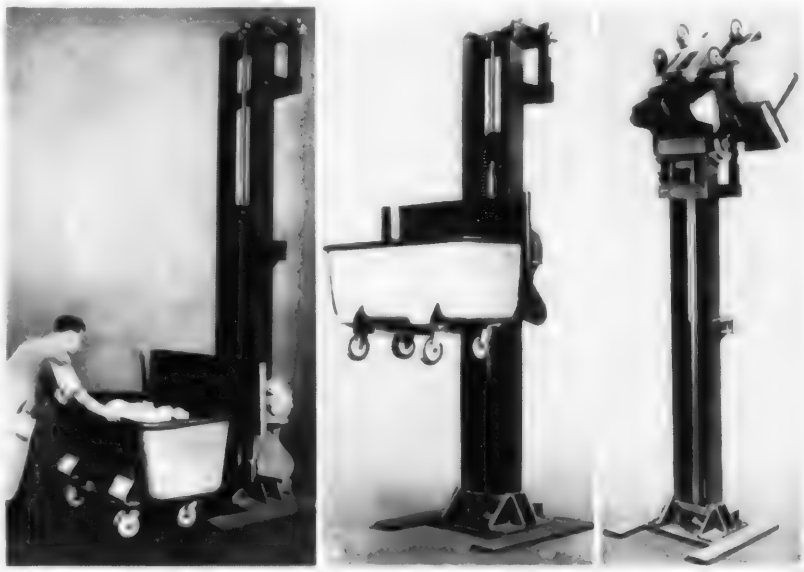
A piston device, operated by a foot control, stretches the bag just sufficiently to insert the meat, whilst an adjustable stop on the piston prevents over-stretching the bag. The meat is then fed into the stretched bag. The self-shrinking property of *Visten* then begins to act, so that in a few moments the bag clings to the meat like a second skin. The bag can be closed by clipping, heat sealing, tying or other desired methods.

The opening and closing strokes of the piston are separately adjustable, so that the gentle closing action cannot crush meat accidently or injure the operator. The foot control assembly is fitted with an air filter, automatic lubricator and pressure control. All connecting hoses are supplied, and the incorporation of a reducing valve enables the machine to operate at the correct pressure of 60-80 p.s.i.

The stuffer is made of stainless steel throughout and will handle anything from a 4-oz. chunk to the largest ham; the whole range of *Visten* sizes can be used with this one machine.

ELEVATING AND TIPPING UNIT

A new loading unit, claimed to be ideal for use in single storey buildings, designed for the mechanical handling of materials which have to be raised and unloaded above floor level, has been produced by Conveyancer Fork Trucks, Ltd. It consists of an electro-hydraulically operated elevating and tilt-



The action of the Conveyancer elevating and tipping unit is shown by these photos.

ing assembly mounted on a steel floor-mounted baseplate and has a fork-carriage lifted by chains and pulley. Standard models have lifting capacities ranging from 1,740 lb. to 4,200 lb., but units can be manufactured to suit customers' individual requirements.

EJECTOR UNIT

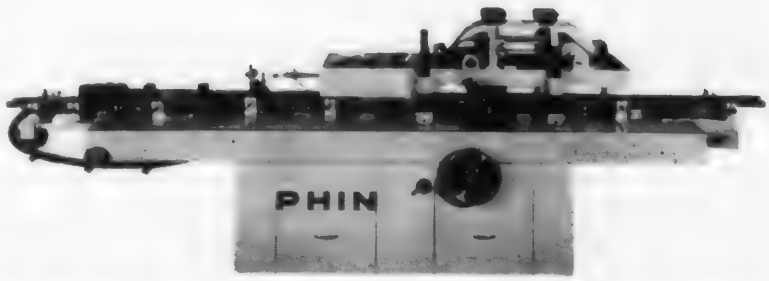
Tickopres, Ltd., have received reports that operators of their TICKOpres *Imprima* machines have been unable to maintain the normal speed of 1,000-2,000 impressions an hour when printing items more than 6½ in. in length. Any longer items have had to be removed individually from the machine by hand. To eliminate this time-wasting extra manual operation, the firm have introduced an ejector unit for use when especially long items are printed or overprinted. The unit may be used with both manual and electric *Imprima* models.

Attached to the front of the machine, the new unit extracts the printed card, label or ticket and deposits it gently on the work-table. It is recommended for use when printing cards, labels, etc., of over 6½ in. but not exceeding 23 in. in length and 8 in. wide, though larger items may be accommodated if necessary.

Electrically powered, the unit has a fractional-h.p. 230-250 v. A.C. motor. Controls are on the same side of the attachment as those of the machine, and a foot-switch may be incorporated.

LABELLER FOR VARIOUS BOTTLE SIZES

The Phin labeller, a straight-line continuous labelling machine of Canadian design with no reciprocating parts, is now offered to the world market by Barry-Wehmiller Machinery Co., Ltd. It has been in use for some time by manufacturers of a wide range of products in the U.S.A. and Canada, and is designed to enable production to be switched from one bottle size to another very quickly by a few simple adjustments.



The Phin labeller, the manufacturing rights of which have now been obtained by Barry-Wehmiller Machinery Co., Ltd., which can be rapidly adjusted to suit various bottle sizes and which has no reciprocating parts.

The machine will handle bottles, jars and cartons of any size and shape up to a width of 6½ in. and a height of 11½ in. at a speed of up to 150 per min. Labels of sizes from 1 × ½ in. to 6 × 6 in. can be accommodated. It is claimed that changeover from one size to another can be made in less than 5 mins. The labeller can be provided with either fully automatic feed and discharge mechanism or fitted for hand loading. Non-corrosive materials including stainless steel and plastics are used extensively in its construction, and the table top is of formica-type material. The machine is driven by a ¾ h.p. main drive motor with a ¼ h.p. vacuum pump motor for label feed. Gross weight is 3,000 lb.

OIL-FREE BEARINGS

The elimination of lubrication in food making machinery thereby entirely excluding risk of contamination by oil, is obviously important, and there are an increasing number of applications for the Glacier DU type of bearing, say the Glacier Metal Co., Ltd. Although having high load carrying capacity, and low friction characteristics this type of bearing is oil free, a specially prepared surface being impregnated with P.T.F.E. The makers say that these bearings are being used by Baker Perkins and Co., Ltd., in bread and biscuit machinery, and also by Mars, Ltd.

LABORATORY HEATING MANTLE

A special digestion unit for carrying out standard fibre determinations in feeding stuffs has been designed by Isopad, Ltd., in co-operation with the Research Association of British Flour Millers. It comprises two banks of six electric mantles heating 1 litre Erlenmeyer flasks with reflux condensers. Each position has an individual energy regulator with neon indicator light.

NEW VENTILATOR

Colt Ventilation, Ltd., have introduced a new ventilator, called the O/S.R. Based on the same principles as the established Colt S.R., this ventilator, by simple cord control, can be opened up wide to the sky, thus increasing its ventilating capacity by approximately 50%.

The makers claim that the new ventilator reduces costs, because less ventilators are required, for the installation can be designed for average conditions whilst, at the same time, there is ample reserve of extract capacity to deal with hot summer conditions.

For normal extraction the top cover-flaps rest on stops, giving complete weathering as in the S.R. Ventilator. A pull of the control cord, however, lifts the flaps of the top cover into the vertical position, thus giving the ventilator a clear opening. When the flaps are dropped into the third position the ventilator is completely sealed.

This new Colt OS/R ventilator opens wider than previous types and is claimed to cut ventilating costs.

PACKAGING

Polythene-lined frozen food carton

For the first time one-piece polythene-lined cartons are being used for frozen food. These were developed and are supplied by The Metal Box Company, as part of their *Diotite* system, to Fropax, Ltd., for packing Fish Fingers.

The new pack is claimed to have all the advantages of the other *Diotite* cartons used by Fropax, and is set up on the same machinery. As the Fish Fingers are fried and packed warm, they need a container with a high degree of built-in grease resistance, and this is given by polythene, bonded to a duplex folding boxboard dry waxed externally. The polythene also gives increased protection against drying out under refrigeration. A very efficient heat seal is obtained, by using the lining itself as the thermoplastic adhesive, and this does away with the need for applying a special sealing material, as is done on the other *Diotite* cartons.

New labels for canned foods

The Metal Box Co.'s package design studios have just produced a complete set of new labels for Maconochie's canned soups and other dishes.

The motif for each can is a large capital M in red, crossed by the name of the firm, in smaller block capitals. Each label is so designed that the large M and the picture of the dish inside the can are both seen at the same time. On tall cans the M surmounts the dish and on flat cans the two march side by side.

These green and pale green bottles for fruit drinks are made by United Glass.

Metal Box packs. (*Top, left*): **These dried pea packs are 7×3 in. "Metathene" pouches.** (*Top, right*): **These frozen food packs are one-piece polythene-lined externally waxed cartons.** (*Bottom, left*): **New labels for Maconochie's canned foods have full colour printing.** (*Bottom, right*): **This display card for Ledbury Conserves features an actual "Roltop" can which fits firmly into the stand.**

The basic colour scheme is red, yellow and white, but full colour printing brings out the picture of the contents on every can.

Jam can and display card

The Metal Box Co. which makes the *Roltop* jam can for Ledbury Conserves, also makes and prints a display card which presents it in a most attractive way on the counter or in the shop window. The photograph in black and white brings home the point that the jam can is a pleasant addition to any breakfast or tea-table, where it harmonises with modern china and the contemporary setting.

The *Roltop* can with its aluminium lid is easily opened and as easily closed. An actual can of jam fits snugly and firmly into this cardboard display stand, and is supported at the back with a sturdy strut.

New dried pea pack

Batchelors' "Surprise" peas, at present in limited distribution, are a new product in a new pack which consists of a 7×3 in. *Metathene* pouch made by the Plastics Group of The Metal Box Company. The peas are dried by a new process and can be cooked in 12 to 15 minutes. The pack contains enough for 3 to 4 helpings and is handy for the casual shopper without a bag.

Display stand

A showcard display stand made by Reed Cartons, Ltd., a member of the Reed Paper Group, for the "Morning Song" products of P. H. Baker (Food), Ltd., is claimed to be easily erected and allows more than three-quarters of the product to be visible. It is secured by a simple locking device at the back.

Coloured bottles for fruit drinks

Two new pure fruit juice drinks made by Pascall-Knight, Ltd., are now appearing in different coloured bottles manufactured by United Glass, Ltd.

Gualime, in a green bottle, is an equal blend of guavas and limes. *Guavo*, an equal blend of guavas and oranges is in a pale green glass bottle which is claimed to show off the orange liquid to advantage.

(Left): **A glossy pink pack for Huntley and Palmer's new "Semi-Sweet Assorted" in "Fiberseal," a proprietary material supplied by the Robinson Waxed Paper Co.** *(Right):* **The first "run" of foil cartons for margarine in this country is being produced by E. S. and A. Robinson, Ltd., for "Blue Band" margarine.**

The shape of these new bottles is the same as the amber-coloured bottle used for an established Pascall-Knight product *Guavin* (guavas and grapes).

Foil carton for margarine

What is claimed to be the first "run" of foil cartons for bulk packing of magarine in this country is being produced by E. S. and A. Robinson, Ltd., for *Blue Band* margarine marketed by Van den Berghs and Jurgens, Ltd. The four-lap, glued carton is fitted with tear-strip ends for easy and tidy opening. It replaces a plain carton and foil wrapper originally used and facilitates higher speed machine packing.

The foil has a matt surface and gravure printing of the three-colour and gold design. The slight sheen of the foil's gold background helps to give the brand name lettering a three-dimensional effect. The back of each carton is printed with one of a series of nine recipes.

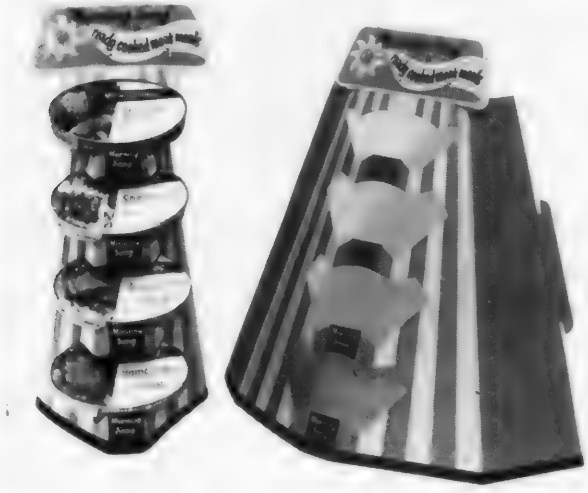
Inside each carton are four individual ¼-lbs. of margarine, individually wrapped in foil supplied by The Robinson Waxed Paper Co., Ltd.

Printed foil stiffeners for fish packs

The range of ready-prepared "Flash Frozen" fish marketed by H. Mudd and Son, Ltd., is now wrapped in transparent film packs, with special foil stiffeners printed with a colourful design and bearing the name of the contents.

The seven stiffeners—one for each type of fish—are printed and supplied by E. S. and A. Robinson, Ltd. The foil is litho-printed in six colours in a standard design, the only difference being in the name of the fish and the main identifying colour used on the left.

The range of seven foil stiffeners supplied for Mudd's fish packs by E. S. and A. Robinson, Ltd.



This showcard display stand which shows more than 75% of the product is made by Reed Cartons, Ltd.

New biscuit pack

A new Huntley and Palmer's biscuit assortment, "Semi-Sweet Assorted," is being marketed in a pink pack of glossy *Fiberseal* made by The Robinson Waxed Paper Co., Ltd. This material consists of a high-gloss paper/waxed paper, laminate claimed to be a good moisture barrier and to keep the biscuits crisp and oven-fresh for long periods. The design is printed on the material in five-colour gravure, and the printed material is supplied in reel form for use on a Pelkman Hayssen automatic machine.

ADVANCES IN FOOD TECHNOLOGY

ANALYSIS

Tin in foods

The sample is ashed with MgO, then fused with KCN and Na_2CO_3, and tin is determined colorimetrically in an extract of the melt with dithiol. The interference of copper, which may be present in some products, *e.g.* tomato puree, can be eliminated by adding KCN to the soln. and filtering. Results for samples of canned and bottled beverages and foods are reported.—F. Bucci and others, *Chim. e Ind.*, 1959, **41**, 294.

Determination of vitamin A in oily solution

The losses (about 7%) of vitamin A during its quantitative determination due to light and air have been studied. Most of the loss occurred during the extraction. The use of dark glass and an inert atmosphere during treatment with KOH prevents the errors.

To 1 g. of the oil add ethanolic KOH soln. to a concn. of 0.5N. Boil for 5 min. under reflux in an atmosphere of N, then extract 4 times with peroxide-free diethyl ether; dry the extract with anhyd. sodium sulphate, evaporate an aliquot in a stream of CO_2, dissolve the residue in spectrally pure ethanol and determine the extinction at 311, 326·5 and 334 mμ.—V. Springer, *Farmacia Bratislava*, 1959, **28**, 44.

MEAT PRODUCTS

Investigations on Yellow Beef Fats

Research carried out at the German Federal Meat Research Institute, Kulmbach, has shown that yellow coloration of beef fats is mainly due to carotene carbohydrates, *i.e.*, alpha, beta and gamma-carotene, but mono- as well as poly-hydroxycarotinoids are also present. On an average, about 65% of the total coloration is caused by beta-carotene. Vitamin A content is relatively low.—A. Mitna, *Die Fleischwirtschaft*, 1960, **12**, 168.

Assessing quality of ham

In order to ascertain differences in the quality of ham purchased from abattoirs, extensive measurements of the *p*H value of the ham have been carried out in a number of meat processing plants in Germany. In general, meat obtained from large slaughterhouses showed, on an average, a higher *p*H value than meat obtained from seaport abattoirs or minor slaughter plants. The quality of the produce depends greatly on the proper treatment of the animals before slaughter, light feeding after transportation, adequate time of rest before slaughter, application of a modern slaughter process, complete cooling of meat before transportation, and hygienically satisfactory transport conditions.—E. Raschke, *Die Fleischwirtschaft*, 1960, **12**, 375.

MEAT

Chilling of hog carcasses

Among the systems used for chilling hog carcasses, brine spray units have not been found satisfactory in Denmark because of their fairly high corrosion rate, and the method now generally adopted is based on the use of dry coil coolers, whilst the use of radiation coolers and of other modern systems is being studied. The Danish Meat Research Institute at Roskilde has carried out research on various aspects of meat chilling. A series of experiments, dating back over many years, has been carried out in order to ascertain the influence of chilling on keeping quality, organoleptic quality and yield of Wiltshire type bacon. Quick chilling resulted in bacon of a better keeping quality and lower shrinkage rate, though the latter advantage was offset by greater shrinkage during trimming and curing. A comparison between different quick chilling methods (dry and wet) revealed no significant difference in the keeping quality of the finished bacon.—M. Jul *et al.*, *Die Fleischwirtschaft*, 1960, **12**, 261.

POULTRY

Micro-organisms associated with spoilage

The investigation reported here was undertaken to determine the types of bacteria associated with the spoilage of chilled poultry under present conditions of processing and marketing, as well as the possible influence of geographical location of processing facilities, location of cutting-up operations, and the use of antibiotics.

One hundred and three cultures were isolated from chilled, cut-up fryers which had been allowed to spoil at 4·4°C. Eighty-eight of the cultures were allocated to the genus *Pseudomonas*. Two additional cultures were classified as members of the genus *Aeromonas*. The remaining 13 cultures were assigned to the *Achromobacter-Alcaligenes* group without any attempt being made to place them specifically in either genus. The use of oxytetracycline as an aid in more precise classification of the *Pseudomonas* species from spoiled poultry was found to be of little value.

Penicillin sensitivity also was not completely reliable for differentiating between the *Achromobacter - Alcaligenes group* and members of the genus *Pseudomonas*. The geographical location of processing facilities, location of cutting-up operations, and the use of antibiotics had no influence on the distribution of genera of spoilage organisms investigated in this study.—C. W. Nagel and others, *Food Technology*, 1960, **14**, 21.

Canning Machinery

(Concluded from page 337)

etc., and with the high vacuum obtainable the brownish formation or "cooked ends" on meat is said not to occur. Another machine in their range is specially designed for vacuumising ham cans. The head of the machine is carried on a hinged swinging arm so that it can be easily centred over the cans on a bench or runway, thus eliminating the stacking and unstacking of cans.

Can conveying

A vertical high-speed can elevator has been designed by Gardiner's Conveyors, Ltd., in conjunction with Batchelors Foods, Ltd., and is said to be specially suitable for the vertical handling of canned goods and for feeding cookers, labelling machines, and packing lines. It comprises twin belt elevators which are adjustable to suit all size cans and capacities, and is electrically driven.

Other conveyors for canning are the *Masterveyor* and the *Handiveyor* conveyors made by A. L. Marshall (Carlton), Ltd. The former can be constructed to individual requirements from prefabricated components, of which more than 1,000 are available; the latter is a portable medium-size mobile conveyor elevator which can be set by one person and fixed with a simple locking device. A recent addition to this firm's range of equipment is the *Extendaveyor*, which has an extendable and retractable boom, giving a variable reach from 17 ft. to 25 ft. 10 in.

NEWS DIGEST

Government to review Antioxidant Regulations

The Government is to review the Antioxidant in Food Regulations, 1958, and the Antioxidant in Food (Scotland) Regulations, 1958. The main points in the regulations which will be considered are the kinds of antioxidants to be permitted, the foods in which they may be used, the maximum allowance for permitted antioxidants, and labelling requirements.

Before deciding whether, and to what extent, amendments to the present Regulations are necessary, the Government will give full consideration to any representations made by interests concerned. Such representations should be addressed to the Assistant Secretary, Food Standards Division, Ministry of Agriculture, Fisheries and Food, Great Westminster House, Horseferry Road, London, S.W.1, or to the Secretary, Department of Health for Scotland, St. Andrew's House, Edinburgh, 1, to arrive not later than December 31, 1960.

Proposals for additions to the list of permitted antioxidants should include information about the indentification of the antioxidants; their properties and proposed uses; methods of detection and evidence of freedom from health hazard.

The reasons should be given for proposed additions to the list of specified foods.

Proposals for the deletion from the list of antioxidants or specified foods should also state the reasons. Where these have to do with the safety of the antioxidant, details of the evidence should be given. Proposals will normally be submitted to the Food Standards Committee for consideration and advice. The recommendations of the Committee will be communicated to interested parties and an opportunity for comment will be given.

An application for a specified food or an antioxidant to be added to the list should be accompanied by the following details: scientific name, structural formula, trade or brand name and commercial purity; proposed and likely uses; an analytical method or methods for its qualitative and quantitative detection in food; and evidence, obtained from toxicity, carcinogenicity, metabolism and physiological action tests, that the antioxidant can be used, in the amounts normally employed, without endangering health. If such evidence is not available, the Council would be willing if requested to discuss the proposed methods of testing with those who would be undertaking the work.

Aberdeen Research Unit may change hands

The possibility of the Ministry of Agriculture, Fisheries and Food experimental factory at Aberdeen being taken over by D.S.I.R. was mentioned on June 20 by Lord Hailsham, Minister of Science, during a visit to research institutes in Aberdeen. The staff at the factory have been engaged in research work on the dehydration of food, but the Minister of Agriculture announced earlier this year that they had completed their project and that the factory was to close next spring.

When questioned by our Scottish correspondent at the Rowett Research Institute, Lord Hailsham said that in certain circumstances the D.S.I.R., for which he is responsible, might be prepared to take over the premises. He made it clear that if his department took over the factory it would be for their own purposes, but he thought it would be a good thing for the locality, and it might mean good news for some of the staff at present working there.

The D.S.I.R. control the Torry Fish Research Station which is "next door" to the factory, and a spokesman for the Torry station said that they were handicapped by lack of space and had a rebuilding programme prepared.

Mr. S. W. F. Hanson, principal officer at the factory, said that while the evident goodwill of the department was most encouraging it did not seem to solve the problem of keeping together the members of a unique food research establishment.

Fish was now the only food with which the department was concerned, and he did not think there was any great significance in the handing over of the buildings to another department next April because by that time the factory staff would have gone elsewhere.

Baker Perkins acquire Rownsons

Baker Perkins announce that negotiations have now been completed for the acquisition of Rownson (Conveyors), Ltd., of Yorks Way, London, N.7, at a purchase price of £95,000.

The directors of the company will be H. Crowther (chairman), C. N. Brown, A. G. Anderson, J. A. Marriott and H. W. Gregory.

Rownsons (Conveyors), Ltd., employs about 200 people and will continue to operate as a separate company.

This latest addition to the Baker Perkins group brings its total of companies in this country, U.S.A., Canada, Germany, South America, Australia, New Zealand and South Africa to sixteen.

And another Baker Perkins acquisition

Baker Perkins, Ltd., Peterborough, have acquired the Granbull Tool Co., Ltd., which manufactures moulds and equipment for the plastics industry and press tools, jigs and fixtures for industry generally, for £85,000.

The company has been associated technically and commercially with Baker Perkins, Ltd., for some time, particularly in connection with the *Autoblow* unit—a Baker Perkins extruder coupled to a Granbull bottle blower, which can produce 960 four ounce plastic bottles an hour. This range has recently been widened to produce mouldings of up to 5 gallons capacity.

Queen Mother to visit Dairy Show

The Council of the British Dairy Farmers' Association announces that Her Majesty Queen Elizabeth the Queen Mother will visit the 74th Dairy Show on Wednesday, October 26, and that Her Majesty has accepted an invitation to luncheon with council members on that day.

Previously Her Majesty has attended the Dairy Show in 1955 and, in company with His Majesty the late King George VI, in 1948.

Foster Clark's former chairman sues St. Martin's

Mr. H. M. Beak, chairman of Foster Clark, Ltd., from 1953 up to the time of the take-over of that company by St. Martin's Preserving Co., Ltd., earlier this year, has issued a writ against Foster Clark, Ltd., for damages for breach of contract and wrongful dismissal from the post of joint managing director.

Newman Labelling Machines, Ltd.

D. Trapow and Co., Ltd., makers for many years of Newman labelling machines designed by the managing director, Mr. R. J. Newman, announce that the company's name has been changed to Newman Labelling Machines, Ltd., the new address of which is Queens Road, Barnet, Herts. (BARnet 9666).

Rapid fish thawing method developed by Torry

The industrial thawing of frozen fish, which normally takes up to 24 hours in air can now be done in about 15 minutes by dielectric heating. This new development, which solves a major problem of the fish industry, is the result of work at the Torry Research Station of D.S.I.R. and is briefly described in the 1959 Annual Report of the Torry Research Station.

It is of great economic importance, especially in view of the steadily increasing large-scale utilisation of frozen fish, and may have wide application in other sections of the food industry.

The method, known as dielectric thawing, depends on the fact that if any material is placed between, but without touching, two metal plates which are charged with an alternating voltage of many thousands of volts at a frequency of about 40 million cycles per second, energy is produced in the material in the form of heat. Under well defined conditions, fish may be uniformly thawed throughout a block of the frozen material, either as whole fish, as in the case of herrings, or as fillets. It is possible to control conditions far more accurately than in existing methods, for example, so that individual fish in a block may be separated while remaining partially frozen.

Laboratory-scale experiments at the Torry Research Station, Aberdeen, had shown that it was possible to use dielectric heating successfully on tiny pieces of frozen fish. Pilot scale apparatus, using slightly modified equipment which is commercially available, was therefore set up. Initially, the problem of "runaway heating" was encountered; small portions of blocks of fish absorbed the major part of the available energy and became cooked, while the rest of the block remained hard frozen.

This problem has now been solved, and fish may be fed into the machine on an endless belt and thawed in 15 minutes.

Capital cost, about £10,000 for equipment to thaw one ton of fish per hour, is comparable to that for freezing equipment of similar capacity. Running and depreciation costs appear to compare favourably with the cost of existing methods of thawing.

The potential results of this development, which is the subject of a patent application, are such that they could revolutionise certain sections of the fish handling and processing industry in a relatively short space of time.

Other aspects of the work of the Torry Research Station summarised in the report, which covers the Humber Laboratory at Hull, are: a new method for quickly measuring the toughness of cold-stored fish; problems of processing and distributing unfrozen fish; further work on smoke-curing of fish; and the operation at sea of a pilot plant for freezing catches.

DCL to build £2m. acetic acid plant at Hull

The Chemical Division of the Distillers Company, Ltd., is to construct a new acetic acid plant at its chemical factory at Hull, at a cost of some £2m. This plant will be the first of its kind in Europe. It will use a new process developed by the D.C.L. Research and Development Department at Epsom and based on the direct oxidation of a light petroleum fraction. It is expected that the new plant will be in operation early in 1962, when a proportion of the company's output of acetic acid will be made by this new process.

Heinz open new premises at Southampton

Another new Heinz Branch building, at Southern Road, Southampton, was declared open by Mr. A. A. Morgan, Assistant Managing Director of H. J. Heinz Company, Ltd., on Wednesday, May 25.

The premises are housed in a modern building and consist of offices for Mr. A. J. Willoughby, Heinz Southampton Branch Manager, and his staff, and a warehouse with a floor area of 24,000 feet which is capable of storing up to 2,700 tons of food.

The Heinz Southampton Branch covers a wide area taking in Hampshire, Dorset, parts of Wiltshire and Sussex, the Isle of Wight, and the Channel Islands. Mr. Morgan said that Heinz have had a warehouse and Branch office in this town since 1937 and every year since that with unfailing regularity it has handled more and more Heinz products. Paying tribute to Mr. A. J. Willoughby, who retires this year, Mr. Morgan pointed out that he is the only Heinz Branch Manager that Southampton has known, as Mr. Willoughby had started the Branch in 1937.

New £1m. animal feed mill at Bromborough

A new compound mill is being built at Bromborough, Cheshire, at a cost of approximately £1 million, for the British Extracting Co., Ltd., of Bromborough Port, New Ferry, Birkenhead, Cheshire, who are oil seed crushers and manufacturers of cattle, sheep, pig and poultry foods for Lever's Feeds, Ltd.

The building work will be closely programmed and integrated with the installation of production plant, some of which will be positioned before the buildings are completed. Work is scheduled to be completed by September, 1961. The mill will comprise a raw materials warehouse, silo building, production building and finished products warehouse, with administrative buildings and ancillary work.

Heinz give £25,000 to Tate Gallery

Mr. and Mrs. Henry J. Heinz and the H. J. Heinz Co., Ltd., of which Mr. Heinz is Chairman, have made a gift of £25,000 to the Tate Gallery.

This is the first donation to be made through the recently formed American Friends of the Tate Gallery and is the largest corporate donation ever made to the Tate. The money will be used for the acquisition of major works by American painters.

Venesta packaging service

The Container Division of Venesta Plywood, Ltd., has established a nation-wide packaging service based on four manufacturing and distribution centres at Erith, Birmingham, Manchester and Glasgow. Eleven technical sales representatives and a national road transport service provides prompt delivery of the extensive range of Venesta plywood boxes, cases, barrels and fibre drums throughout the country. Cases from large regular contract orders may be delivered within 48 hours.

"Limitless future for canning" says Lady Lewisham

Opening an exhibition at the Ceylon Tea Centre to mark the 150th anniversary of canned foods on June 21, Viscountess Lewisham said that there is no doubt that tinned food tastes better than ever before and urged manufacturers not to rest on their laurels but experiment continually to give the public not only what tastes nice but what is also good for our health. She added that the future of the canning industry was exciting and almost without limit. Last year over £300 m. was spent on canned foods.

A feature of the exhibition, which closed on July 15, was a programme of films on canned foods, including a French colour film "L'Art de Conserver," which received its British premiére at this presentation. Individual exhibits included the world's oldest can, dating from 1823.

The anniversary year will terminate on October 13 with a banquet at the Guildhall in the presence of the Lord Mayor of London.

This new cold store opened recently by Northern (Frozen Foods), Ltd., at Espresso House, Beverley Road, Hull, is the latest addition to the expanding Northern Dairies group of companies; its blast freezers have a capacity of 20,000 cu. ft. on a floor area of 70 × 30 ft., and the temperature does not rise above 20° F. The premises are devoted to the production and storage of bakery and meat goods. External freezing units leave the store entirely free of obstructing pipes or plant; two 5 h.p. blowers direct cold air into the chamber, and the refrigeration plant has two 25 h.p. compressors. Crompton Parkinson supplied the blower and compressor motors and the "Clenelite" fluorescent light fittings.

Marine expedition aids fish science

Findings of "great value" to fishery research have resulted from an international expedition, just completed, to the under-water ridge between the Faroe Islands and Iceland. Announcing this, Dr. John B. Tait, who organised the expedition, called it "A magnificent example of international co-operation." Five nations took part, including Russia. Research ships of various nations kept in radio contact with one another.

Dr. Tait, who is head of the hydrographic section of the Marine Laboratory at Torry, Aberdeenshire, was aboard the laboratory's research vessel *Explorer* during the three weeks of the mission. It was the biggest-ever marine probe of its kind. Its object was to determine the existence, flow and variations of the heavy cold water over-spill over the ridge from the arctic to the Atlantic.

This cold water overspill is believed to affect the flow of nutrient salts in deep oceanic waters, these salts being the fertilisers of the marine vegetation on which fish feed. White fish are dependent on this continental shelf for their food. The expedition, therefore, was concerned with the question of the fertilisation of the region, which is about 200 miles wide.

"We made a survey three times, with a week's interval between," explained Dr. Toit. "We located and measured the cold water overspill on each occasion. We probed the sea bottom, reaching to a depth of about 1,400 metres. The Russians went down about 2,500 metres."

The survey was carried out under the auspices of the International Council for the Exploration of the Sea, who meet in Moscow in September. Dr. Tait is going to Moscow to report on the findings of the expedition.

Ayrshire wants industry

Concerned at the unemployment situation in Ayrshire, the Ayr County Council has issued a brochure telling industrialists the sites and facilities available within its area for new industries. The brochure may be obtained from the County Planning Officer, County Buildings, Ayr, Scotland.

Census of Production report

Part 1—Introductory Notes (price 3s.) and Part 12—Sugar (price 1s. 9d.) of the Report on the Census of Production for 1958, which will be published in 135 parts, are now available from H.M.S.O.

Technical Press Review

Automatic Butter Blending

"Automatic Blending of Butter" is the title of an article in this month's issue of our contemporary journal, **Dairy Engineering**.

Other articles in the same issue are: "Choosing Lighting for the Dairy," "Running a Dairy Transport Fleet," "Colombia's Contribution to Dairying in South America" and "Practical Cleaning Routines for the Dairy."

Some August selections from our other journals:

Paint Manufacture. — "The Selection of Resins for Printing Inks"; "Lanolin in Inks"; "Paraformaldehyde in Alkyd Resins."

Petroleum. — "World's largest Wax Plant"; "Newer Organic Chemicals in Metal Protection and Lubrication"; "Compressed Hydrocarbon Gases as a Solvent"; "Automatic Seam Welding: the new Circomatic Technique."

World Crops.—A special number dealing with farm vehicles and the Royal Show. Special articles will include: "Farm Vehicles — transportation in tropical and sub-tropical agriculture"; "Machinery for Grass Conservation"; Royal Show Review; "Rust Disease of Coffee—4: Control by Fungicide."

Chemical and Process Engineering.—"Materials of Construction for Chemical Plant: 1—Stainless Steel; 2—Sigma Phase in Austenitic Stainless Steels"; Special feature—"Dust Control and Prevention"; "Latest Developments in Dust Control"; "Estimation of Dilution Calculations."

For specimen copies write to Leonard Hill House, Eden Street, London, N.W.1.

New Petfood range

Petfood's, Ltd., have added a new cat food, *Minx*, to their range of pet foods. They point out that since 1050 their product *Kit-e-Kat* has dropped in price by 37% while during the same time average wages at Petfood's have risen by 87%.

"Dehydration of Carrots"

In table 2 of the article "Dehydration of Carrots" on p. 251 of our June issue, the dimensions of strips and dice were inadvertently omitted. The table should read as follows:

Strips	$\frac{3}{16} \times \frac{3}{16}$ in.	6·0%
,,	$\frac{3}{32} \times \frac{3}{16}$ in.	4·5%
Dice	$\frac{3}{16} \times \frac{3}{16} \times \frac{3}{16}$ in.	6·1%
,,	$\frac{3}{16} \times \frac{5}{16} \times \frac{3}{8}$ in.	5·4%
,,	$\frac{1}{16} \times \frac{5}{16} \times \frac{3}{8}$ in.	4·2%
Slices	$\frac{1}{8}$ in.	6·1%

PEOPLE

T. Giusti and Son, Ltd., have announced the appointment of MR. LIVIO N. BORRA to the board of directors.

*

MR. R. T. CLACK has retired from Mac Fisheries, Ltd., for personal reasons. Mr. Clack, who has been with the company for nearly 40 years, became managing director in 1958.

*

MR. BRIAN H. TURPIN, managing director of QVF, Ltd., and Quickfit and Quartz, Ltd., manufacturers of interchangeable laboratory glassware, has been elected to the Council of the British Chemical Plant Manufacturers' Association.

*

The following have been elected as officers of the Industrial Pest Control Association for the year 1960-61:—president, MR. D. J. S. HARTT (May and Baker, Ltd.); vice-president, MR. G. A. CAMPBELL (the Geigy Co., Ltd.); hon. treasurer, MR. S. FARROW (London Fumigation Co., Ltd.).

*

Spring and Co., Ltd., of Brigg, Lincolnshire, have appointed MR. H. R. DARBYSHIRE general sales manager and sales director, a new position in their executive staff. Mr. Darbyshire was formerly sales manager and a director of John E. Goodwin (Hereford), Ltd.

*

MR. H. R. HARRISON has been appointed Manchester area manager for Brian, Jenks and Co., Ltd.

Mr. Harrison, who was previously with Smedleys, Ltd., might have become a professional cricketer instead of a member of the canned goods industry as he had an offer in 1950 to turn professional for Lancashire. Mr. Harrison is vice-captain of Cheadle Hulme Cricket Club.

*

British Belting and Asbestos, Ltd., announce the following appointments to the board of directors: MR. P. H. A. MOUNT, Mintex Division sales manager; MR. D. M. PEARSON, Mintex Division works manager; MR. J. H. FENTON, personnel manager; and MR. C. M. FENTON, Asbestos Division works manager.

*

MR. D. J. MUNNS, B.SC., A.R.I.C., chief chemist, and MR. W. E. LYNN, sales manager, have been appointed to the board of H.P. Sauce, Ltd.; and MR. C. DIXON, F.C.A., and MR. T. P. C. SMITH have been appointed local directors of the company.

MR. H. G. WRIGHT, having reached retiring age, has resigned from the boards of H.P. Sauce, Ltd., and Lea and Perrins, Ltd.

The A.P.V. Co., Ltd., has appointed MR. F. G. WELDON, home sales manager, Dairy Engineering Department. This post had been held for many years by the late Mr. J. S. Menzies, whose deputy Mr. Weldon had been since November, 1959.

He joined A.P.V. over eight years ago as a sales engineer and is already well known to many of the company's customers in the Dairy Industry, especially in the North of England.

Mr. Weldon, who is married with two children, has lived in Shrewsbury for the past few years and will continue to do so for the time being, paying special attention to the Midlands and the North West which territory will, eventually, be taken over by MR. J. R. Boss who is, at present, undergoing training.

*

J. W. French and Co., Ltd., who have acquired Chelsea Flour Mills, Ltd., announce that DR. M. C. SCHAUL, MR. A. HAAS and MR. HENRY COHEN, directors of Chelsea, have been appointed to the board of French, whose chairman is MAJOR J. E. FRENCH, M.C.

Dr. M. C. Schaul

Miss J. Fulcher

Mr. Haas has also been appointed to the board of Frenlite Flour Mills, Ltd., the new French subsidiary which is to take over the business of French. MR. A. G. GOWLETT, a director of French, has been appointed to the board of Chelsea.

*

MR. I. H. J. JAMES, a director of Mac Fisheries, has been put in charge of the company's modernisation and expansion programme, which includes acquisition of new shop sites.

*

Following the sudden death of MR. W. DUNBAR FERNS who had represented the Kestner group of chemical engineers in Scotland for the last 15 years, the Kestner Company announce that his son, MR. A. W. DUNBAR FERNS, B.SC., has now joined their staff as technical sales engineer and will represent the Kestner interests in Scotland. He was a student of Glasgow Academy and qualified at the University of Glasgow.

Mr. F. G. Weldon Major J. E. French

MISS JOAN FULCHER has joined the Public Relations Department of Birds Eye Foods, Ltd., as the company's Consumer Relations Officer. She will be responsible for liaison with the Unilever Food and Cookery Centre, where much of the product testing and development for Birds Eye is conducted, for special promotions and other activities connected with women's interests.

Born in 1930, Miss Fulcher graduated from Westfield College, London University, in 1951 and has worked in the publicity departments of British European Airways (1951-55) and Guinness (1955-60).

*

Huntley, Bourne and Stevens, Ltd., announce that MR. L. VICTOR SMITH, O.B.E., M.C., has relinquished his appointment as managing director but that he will remain deputy chairman. He remains too a member of the Committee of Management of Huntley and Palmers, Ltd.

His successor is MR. H. L. LINDLEY. Educated at Wellington College and Birmingham University, as a Territorial Officer he served with the East Riding Yeomanry in the last war and was taken prisoner at Dunkirk serving with the rearguard.

*

Her Majesty the Queen has graciously awarded the C.B.E. to MR. DOUGLAS JAMES, managing director of the Pearlite Box Co., Ltd. With many years of creditable work dedicated to the hospital service, with Chambers of Commerce and Rotary Clubs, Mr. James has also been chairman of the Regional Industries Committee for London since the end of the war and is now Regional Member on the National Savings Committee, responsible for all savings in London and six Essex towns who together raise some £200,000,000. A one-time member of Hendon Council, Mr. James was also honorary secretary of Edgware Ratepayers' Association and is still vice-president of the Edgware Symphony Orchestra and a governor of the Mount School, Mill Hill.

DR. H. G. HARVEY, formerly principal research chemist and head of the Liaison Advisory Unit of the B.F.M.I.R.A., has now set up in practice as a specialist consultant chemist, technologist and analyst. Earlier in his career Dr. Harvey was chief chemist and technologist to a large food manufacturing company, concerned with a very wide range of products.

In his research activities he specialised in the investigation of physico-chemical properties and processes including gels, pastes, oils and fats, rheological properties, mixing, diffusion and flavour assessment techniques, and the application of research results to a wide range of foodstuffs.

■

W. and T. Avery, Ltd., have appointed MR. R. C. HALE as director and commercial manager.

Educated at King Edward's School, Birmingham, and Birmingham University, Mr. Hale joined the company as a trainee in 1939.

After war service in the Royal Artillery he rejoined the company and was successively a retail, composite and industrial representative. Subsequent appointments as district manager and area manager followed and he joined head office executive sales staff in 1957.

■

MR. J. A. HARVEY has resigned as general sales manager (Bisol) of the Chemical Division of the Distillers Co., Ltd., and MR. R. M. F. FENNING (formerly marketing manager) has been appointed in his place.

MR. A. A. PUDDICK, export sales manager, has been appointed marketing manager, and MR J. TEDD succeeds Mr. Puddick as export sales manager.

■

MR. L. P. SIMPSON, works manager of Baker Perkins, Ltd., has been appointed a director. Educated at Cheadle Hulme School, Cheshire, and Manchester University, where he took an honours degree in engineering, he served a post graduate apprenticeship with Joseph Lucas, Ltd., and worked for Simms Motor Units and Brush Electrical Engineering before joining Baker Perkins, Ltd., as assistant works manager in 1951. He was appointed works manager in January, 1956.

Mr. Simpson is a member of the council of the Institution of Production Engineers.

■

Two members of the Birds Eye Foods' organisation were awarded M.B.E.'s in the Birthday Honours List. They are MR. W. E. LEACH, production manager at Birds Eye's Lowestoft factory, and M. JEAN VINCENT, former head of the Cookery Department, Westminster Hotel School, and now with Birds Eye's Development Department, Great Yarmouth.

MR. J. E. BISHOP has been appointed general sales manager of the Pulsometer Engineering Co., Ltd., and Joseph Evans and Sons (Wolverhampton), Ltd., designers and manufacturers of pumps and pumping plant, of Reading and London.

Mr. Bishop who took up his new duties at the beginning of June, has had wide experience of the pump industry. After receiving his training with Gwynnes Pumps, Ltd., he held appointments with the Permutit Co., Ltd., and Worthington Simpson, Ltd., before becoming sales manager for Sigmund Pumps, Ltd., and subsequently general manager of Lee Guinness, Ltd.

■

Obituary

We regret to announce the death on June 1 of DR. J. H. OLIVER, brewing consultant and senior partner in Briant and Harman.

Reed Paper Group

The Press and Public Relations Office of the Reed Paper Group has moved to Blackfriars House, New Bridge Street, London, E.C.4 (FLEet Street 7701). Group P.R.O. is Mr. Cyril Shrubshall.

New Walls ice cream depots

The latest depots of T. Wall and Sons (Ice Cream), Ltd., to go into operation are at Islington, London, and at Newcastle-under-Lyme. The first serves an area containing more than 1 million people and has storage space for 2 m. portions of ice cream at −50°F. Manager is Mr. Eric Turver, who has a staff of 30.

The second has an area of more than 13,000 sq. ft. and can store about 1 m. portions for the 715,000 inhabitants of the Potteries. Manager is Mr. H. L. Arnold who has a staff of 28.

Erections and Extensions

Neilson's Ice Cream and Frozen Foods, Ltd., have opened a new branch distribution depot at Maidstone, Kent.

■

Tarver and Sidwell (Frozen Foods), Ltd., are having a cold store erected on a site near Powell Road, Coventry.

■

Greco Brothers, Ltd., biscuit manufacturers, are extending their factory in Suffield Street, Middlesbrough, Yorks.

■

J. Sainsbury, Ltd., are having a food factory built at Buntingford, Herts.

■

Thomsons Bakeries (Brighton), Ltd., are having a bakery erected on a four-acre site at North Woodingdean Industrial Estate, Brighton, Sussex. The bakery will employ a staff of 500.

■

Tip Top Bakeries, Ltd., are having new bakery and depot premises built on the North Woodingdean Industrial Estate, Brighton, Sussex.

■

A pig progeny testing station is being built at Greenmount Agricultural College, Muckamore, Co. Antrim, N. Ireland.

■

Birds Eye Foods, Ltd., have had plans approved to extend their existing processing building at Lottbridge Drive, Eastbourne, Sussex, and to erect a new cold store and boiler house.

McVitie and Price, Ltd., cake and biscuit manufacturers, are having a branch warehouse built at Wallisdown Road, Bournemouth, Hampshire.

■

Carltona, Ltd., custard powder manufacturers, are extending their factory in Victoria Road, London, N.W.10.

■

Hay and Hindmarsh, Ltd., of Bedlington, Northumberland, are having a meat processing factory built on a site at Saltmeadows Road, Gateshead-on-Tyne.

■

Sansinena, Ltd., are proceeding with plans for the early erection of a meat and tinned food depot at Drummond Road, Croydon, Surrey.

■

Papropack, Ltd., packaging manufacturers, are having a factory built on a site at Hedon Road, Hull, Yorks.

■

W. Phillips and Co. (Preserves), Ltd., are extending their factory in Gurney Road, London, E.15.

■

Bowater-Eburite Flexible Packaging, Ltd., have acquired a site of 18 acres at Hoath Lane, Gillingham, Kent, for the erection of a factory for the production of food cartons, coated wrapping papers, waxed papers and film and paper bags. It is expected that construction will begin in March or April.

Biological testing station "absolutely essential"

Food Association Presidential Address

The President of the B.F.M.I.R.A., Prof. A. C. Frazer, M.D., D.Sc., F.R.C.P., Professor of Medical Biochemistry and Pharmacology at the University of Birmingham, in delivering his Presidential Address said it was, in his opinion, absolutely essential that a Biological Testing Station should be set up in this country. The station should not only test food compounds and carry out investigations, but act as an Information Centre. This would be invaluable to the Food Industry.

Prof. Frazer said that food additives could be divided broadly into three classes—primary, secondary and intentional additives. Residues of agricultural chemicals came into the first class and since most of these owed their effectiveness to some biological action, the possibility of residues persisting in the finished foods was a matter of concern. The subject was one which called for more knowledge of these biological effects, adequate administrative controls and, above all, education of the persons supervising the application of these chemicals to crops.

Amongst secondary additives, Prof. Frazer referred to traces of metals and other materials gaining access to foods from processing machinery and substances migrating to food from packages, e.g. the plasticisers used in some synthetic wrapping materials. Contamination, particularly, by plasticisers, called for careful control and could be solved by choosing materials of low extractability and of a comparatively low order of toxicity.

Turning to the main subject of his address—intentional additives—Prof. Frazer listed ten broad classes of additives, i.e. acids, alkalis, and buffers; sequestrants (such as citric and phosphoric acids); surface active agents (emulsifiers, etc.); stabilisers (agar, pectins, cellulose esters); a wide range of preservatives from benzoates, sorbic acid and propionates to certain antibiotics; antioxidants; bleaching agents (for flour); colours; flavouring agents (a wide range of substances that needed extensive study); and nutritional supplements including vitamins and amino acids. It was generally accepted in these days that additives were necessary for the benefit of the consumer in that they made possible the provision of better food, more acceptable food, and larger quantities of food. It was likewise agreed that the use of additives to conceal inferiority, to cover up bad manufacturing practice, or to deceive the consumer was unethical and unacceptable.

It was desirable that specifications should be set for all additives and each additive should be considered in the context in which it was to be used. Prof. Frazer then referred to the comparison between "natural" and "synthetic" substances in the following terms:

"There is still a wide belief and we all fall into it . . . thinking that things which are natural must be safe, and that things which are synthetic are suspect. This is completely untrue. Synthetic substances on the whole are much purer, much cleaner chemical substances; your information on them is much more accurate than it is about most natural products, and natural products are usually of a relatively low degree of purity."

Quality Bacon Association

A new national organisation, the National Quality Bacon Association, was formed on May 4 at a meeting of the National Provisional Committee of the County Bacon Associations. The chairman is the Hon. F. N. W. Cornwallis, the vice-chairman Mr. D. C. Parrish.

There are 17 county bacon associations, and the aim of the new association is to co-ordinate and develop their activities in producing and marketing high quality bacon. The address of the Association is Agriculture House, Knightsbridge, London, S.W.1.

PIDA Scottish office change of address

The Scottish office of the Pig Industry Development Authority has moved to 5, Duke Street, Edinburgh 1 (Waverley 5985)

Forthcoming Meeting

The *Plant Phenolics Group* is holding a meeting on "The Chemistry of Cacao" at Cadbury Bros., Bournville, Birmingham, on Friday, September 9, 1960. Further details may be obtained from the Hon. Secretary, Low Temperature Research Station, Downing Street, Cambridge.

Daniels—a disclaimer

Mrs. Zena Daniels, of Flat 25, 56, Porchester Terrace, W.2, and Mr. David Daniels, of Phyllis Court, 22 Rosecroft Avenue, N.W.3, directors of S. Daniels and Co., Ltd., of Oxford House, 15 Crosswall, London, E.C.3 desire it to be known that they are in no way connected with persons of similar names who have recently figured in reports of High Court proceedings.

Food in Parliament

What foods were under consideration by the Food Standards Committee M.P.s asked the Minister of Agriculture, Fisheries and Food, Mr. John Hare. His reply: Meat pies and canned meat, bread and flour.

The whole field of food additives was being kept under review by the Committee, it was stated when an M.P. asked for a list to be published of additives which could be regarded as safe from a health point of view. The Minister said it was not possible to give a comprehensive list. In the light of reports by the Committee regulations had been made to ban the use of preservatives, antioxidants and colouring matters in food except those specifically permitted. Similar regulations about emulsifying and stabilising agents were under consideration.

Are antibiotics hazardous?

Also under examination by a Joint Committee of the Agricultural and Medical Research Councils, it was reported, was the possible consequence of feeding antibiotics to farm animals. The experts were considering whether this practice constitutes a danger to human or animal health. Any question of amending the regulations would be looked at in the light of their advice.

Short-measure beer cans

The marking on cans of beer of accurate measures of the contents was a subject which it was preferable to deal with in the new Weights and Measures Bill, in preparation and due to be presented in the next session of Parliament. This was the Board of Trade President's response to a Labour M.P., Mr. George Darling (Hillsborough), who asked for the introduction of regulations governing the matter. He complained that some breweries printed the words "two-glass size" on cans which, when emptied, were found to contain a glass and a half. It was only one example of misleading labelling, the M.P. protested. Mr. Maudling agreed the situation was unsatisfactory as it stood. The Bill which would deal with this and other matters was now "practically ready," he announced.

Imports

If applications were made by the users to remove the import duties on soya bean meal and oilseed proteins, the President of the Board of Trade would give consideration to them, it was stated in answer to a query.

Import quotas for bacon and butter from Poland for the 12 months beginning July 1, 1960, were the same as those for the calendar year 1959, said Mr. Frederick Erroll, Minister of State, Board of Trade. Interim quotas of 20,000 tons for bacon and 10,000 tons for butter were established for the first six months of 1960.

OVERSEAS NEWS

Too much sugar in South Africa

During the season which started on May 1, 1960, it will be necessary to restrict the production of sugar to a level below that reached in the past season. The reason is that the production of sugar in South Africa now exceeds demand in the markets available to the industry.

Some years ago the industry set a target of one million tons of sugar to be reached by 1960-61. The objective was achieved in 1958-59, when a total of 1,100,000 tons of sugar were produced, thanks largely to good weather conditions and improved technical ability. The expected increase in consumption in the South African market did not materialise in the past two years, however, probably because of the slight economic stringency which has affected the country as a whole. It is not possible for the industry to increase its exports, which are limited under the International and Commonwealth Sugar Agreements. Further factors affecting the industry in disposing of its sugar are the increasing production in Rhodesia and the fact that Swaziland is now coming into full production of its restricted quota of 80,000 tons. In the circumstances, the sugar industry will have to restrict production of sugar this season to about 940,000 tons, at which level there will be sufficient to meet all the country's export obligations, all the foreseeable demands of the local market and enough to enable the industry to carry forward a substantial tonnage at the end of the season.

Machinery is being set up which will ensure a distribution of the cut evenly over all milling companies and cane growers without disturbing the close integration of the two sections of the industry.

First in East Africa

The first African-owned all-electric bakery in East Africa was opened recently by Kenya's Minister for Commerce and Industry, Dr. J. G. Kiano, at Tala, near Machakos, in the Colony's Southern Province.

The bakery is owned by Mr. Andrew Nthiwa, who was among the first Africans in Kenya to attend a tradesman's course in bakery. His first bread was made in an oven built from an oil drum.

Now Mr. Nthiwa has his own generator to produce electricity for lighting and to drive the modern baking machinery. He also plans to open a café.

At the opening ceremony Dr. Kiano said the bakery was "the successful achievement of a man whose initiative is highly commendable and whose faith in Kenya's prosperity is firm."

The Ministry of Commerce and Industry had repeatedly indicated its desire to encourage small businessmen, said Dr. Kiano. "I am well aware of the very big responsibility which small businessmen must shoulder if the standard of living of the people of this country is to continue to increase," he said.

Dairy plant for Vietnam

Two Australian dairy experts have been sent to Saigon under the Colombo Plan to install dairy equipment being supplied to Vietnam. A complete milk treatment and refrigeration plant, with generating plant, has arrived at Ben Cat experimental dairy farm, 35 miles from Saigon, established with Colombo Plan aid from Australia 3 years ago.

European trade patterns discussed in Rome

Trade patterns between countries of the European Common Market and the European Free Trade Association (EFTA) have been the centre of discussion by the FAO in Rome.

Common Market and EFTA traditionally buy more agricultural products from the outside world than they do from each other. This, and other basic relationships in agricultural trade among EEC countries, the EFTA and the rest of the world, is based on statistics for 1957, the latest year for which detailed and reliable information is available. It relates thus to a period preceding by more than a year the birth of the Common Market and the coming into being of EFTA. The trends, however, are considered of prime importance by agricultural and economic planners in Rome viewing problems from a global angle.

In all, the two regional groups, EFTA and Common Market, imported agricultural commodities worth more than $16·5 billion in 1957. Of this, $4·2 billion was for agricultural raw materials and more than $12 billion for food and beverages. In the case of EEC, agricultural imports in 1957 comprised 36% of total imports, and in EFTA countries, excluding Switzerland, 40% of total imports.

The study has also shown that the EFTA countries imported more agricultural goods from the EEC countries than did EEC from EFTA. Only 8% of agricultural imports of EEC came from EFTA states, while 11% of imports from EFTA countries came from EEC.

Within the European Economic Community, trade between members in agricultural products was larger than between the EFTA countries. It amounted to 15% of the total agricultural imports, while for EFTA it was 80%.

Viewing the exports and imports of food and beverages of individual countries in the European Economic Community, the FAO study has shown that they trade more with each other than with EFTA. The exception is Italy, which imports more from EFTA countries and particularly from Switzerland, Denmark, Norway and Austria, than from EEC countries.

In contrast with the EEC, generally speaking, all members of EFTA except Norway and Portugal imported more from EEC than from their fellow members of EFTA.

"You know, I've often wondered whether this stuff really works."

Bumper cocoa crops expected

Ghana and Nigeria, the largest cocoa producers in Africa, are both believed to have bumper cocoa crops this year. Reporting this from Accra, Barclays Bank D.C.O. says that the reasons given for this are capsid control through spraying and new plantings coming into production. Ghana's output for 1959/60 is estimated at 660,000,000 lb. compared with 575,000,000 lb. for 1958/59. Total African production is estimated at 1,376,100,000 lb. against 1,252,940,000 lb.

The Bank adds that trials by the West African Cocoa Research Institute have yielded large increases over two years when shade was reduced and fertilizers used, while capsid damage was controlled by insecticides. The second year yields rose from 958 lb. per acre on shaded plots without fertilizers to 3,091 lb. per acre on fertilized plots without shade trees.

Ice cream in New Zealand

New Zealand ice cream companies today sell about 5 million gallons a year. In 1909, the annual Dominion production of ice cream was about 1,000 gallons.

Now—"Macropak"

The 6th international packaging exhibition, to be known as "Macropak," will be held from May 2-9, 1961, in Amsterdam in the new R.A.I. exhibition halls that will be ready by that time.

Still more Pepsi

Pepsi-Cola International announce the opening of three more bottling plants, bringing their total of world-wide operations, outside Canada and the United States, to 213 plants in 83 countries.

The new centre at Haseleunne was the nineteenth in West Germany. At Kano, Nigeria, the plant was the first Pepsi opening in that country, but the third to be opened in the Pan-African Division this year.

The third plant at Algiers marked the début of Pepsi-Cola in Algeria.

Opportunities in Northern Nigeria

Mr. David Roberts has taken up the duties of the post of Industrial Secretary to the Government of Northern Nigeria, having returned to England after serving in Northern Nigeria, and in Lagos, since 1946. He was recently acting as Permanent Secretary to the Ministry of Trade and Industry in Kaduna, the regional capital.

Mr. Roberts' function, in co-operation with the Economic Secretary for the Federation at Nigeria House (Mr. David Rosser), is to contact United Kingdom managements willing to set up industries in Northern Nigeria. Among industries in which there is scope for expansion are bakery, confectionery, jam, coffee and other food processing.

Australian bread research labs opened

The new laboratories and administration block of the Bread Research Institute of Australia, situated at North Ryde, were recently opened by the Hon. D. A. Cameron, O.B.E., M.P., Federal Minister for Health and Minister in charge of the C.S.I.R.O., in the presence of nearly four hundred bakers, millers, wheat growers, chemists, government and university representatives.

Originally formed and financed by the Bread Manufacturers of N.S.W., the Institute is now an Australia-wide organisation, and is affiliated with the C.S.I.R.O., which supports the Institute with research grants which are related to the income subscribed by industry. Attached to the Institute is the C.S.I.R.O. Wheat Research Unit, which was established in 1957, and which is supported by a grant from the Wheat Industry Research Council.

U.S. pre-cooked food for Germany

American pre-cooked foods have arrived in Germany. One of the country's leading mail-order stores, Neckermann Versand K.G., which also runs department stores, has taken up the idea.

The foods—main dishes, snacks and pies—are supplied by Blue Star Foods Inc. of Council Bluffs, Iowa. They are shipped to Hamburg in refrigerator ships and then taken by road to the Neckermann shops.

Two major U.S. food concerns—General Foods and Corn Products—are represented in Germany by manufacturing subsidiaries.—*Financial Times.*

Dominican Republic coffee firm opens new factory

The opening of a new coffee processing factory by the Dominican Republic firm of Cafe Santo Domingo, C. por A., testified, said the Company's President, Sr. Miguel Rodriguez Pereyra, to the strength of the Dominican coffee industry. The plant, which is equipped with roasting, grinding and packaging machinery, started operating on May 3. Production is to be mainly directed to the home market. This is the first large scale coffee processing in the country, the bulk of the Republic's exports being in the raw form.

U.K.-Poland trade agreement

Negotiations in London between representatives of the United Kingdom Government and the Government of Poland have resulted in the signing of a new Trade Arrangement providing a basis for trade for the three year period beginning July 1, 1960. Under this Arrangement import quotas on both sides will be negotiated annually.

Lists of quotas for the twelve months from July 1, 1960, have also been agreed. These envisage an increase in U.K. exports to Poland from the figure of £16½ million in 1959 to about £20 million. They also envisage an increase in Polish exports to the U.K. from about £33 million in 1959 to about £35 million. The quota list for U.K. exports to Poland includes capital goods, machinery and equipment, chemicals and basic materials and other goods. The quota list for imports from Poland includes bacon, butter and other foodstuffs.

Bachelor of Food Technology?

A new degree, Bachelor of Food Technology, may be offered at Massey Agricultural College, in New Zealand, soon, and will replace the present degree of Bachelor of Agricultural Science in dairy technology.

The suggestion for the degree was one of the recommendations passed by the Academic Board of the University of New Zealand for submission to the University Senate. The board met in Auckland recently. The chairman stated that the new degree would be the first for technological training in New Zealand and would include much of the former dairy technology course, but would be expanded to take in the whole field of food processing. The recommendation was for a 4-year course.

W. Germany stops sugar imports

The West German Government has suspended sugar imports from Peru, Cuba and the Dominican Republic, owing to high domestic production.

West Germany imported 4,074 tons of sugar from Peru during the first quarter of this year.

American flour mill for Nigeria

The Federal Government of Nigeria has decided to invite the Southern Star Shipping Co., Inc., of New York to set up and operate a flour mill in Nigeria. The capital investment will be over £2 million of which the majority will be provided by the Southern Star Co., but there will be opportunities for substantial Nigerian participation.

The mill will be able to produce 67,000 tons of flour a year and will be set up at Apapa. It may be the forerunner of other mills at Port Harcourt and possibly in the Northern Region at a later date.

German canning plant for Scotland?

A herring processing and canning factory may be built by a German firm at the little Ross-shire village of Avoch. Representatives of the firm, which has its headquarters at Kiel, have already visited Avoch and inspected possible sites.

The Highlands and Islands district committee to the Scottish Board for Industry were told that samples of Kessock herring have been sent to Germany for laboratory tests. The committee chairman, Provost A. Mackenzie, Stornoway, said later: "We have been informed by the firm that there is a big potential demand for these Kessock herring, too, both in Europe and in America. They are also considering canning sprats, and we understand that the factory will employ about 50 people in its initial stages."

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

841,316. UNILEVER, LTD.: Cocoa-butter substitutes and their use in chocolate and confectionery.

840,851. SYMINGTON WAYNE CORPORATION: Apparatus for dispensing either one of two different liquids or alternatively mixtures in selected ratios of the two different liquids.

841,208. STAHMER, B.: Sliced corrugated potato products.

840,981. MOLINS MACHINE CO., LTD., and C. T. HALL: Device for turning packets over in packing machines.

841,288. MOLINS MACHINE CO., LTD., and D. R. P. JACKSON: Apparatus for packing rectangular block-shaped articles in cartons.

841,026. BRITISH OXYGEN CO., LTD.: Device for sensing and indicating changes in flow conditions in a fluid-pumping system.

841,163. H. SIMON, LTD.: Pneumatic conveyors and the like for powdered and granular materials.

842,007. R. G. T. BAADER: Methods of and machines for dressing fish.

842,034. SWIFT AND CO.: Processing poultry.

841,736. KOEHLER AIRCRAFT PRODUCTS CO.: Diaphragms for fluid-control valves.

841,973. STANDARD BRANDS, INC.: Irish moss food product.

841,756. LICENCIA TALALMANYOKAT ERTEKESITO VALLALAT: Method for the continuous purification of milk of lime for use in sugar mills.

842,901. ROHM AND HAAS CO.: Process for dewatering aqueous suspensions.

842,926. H. NAIMER: Packing container for articles susceptible to shock.

842,660. MEAD PACKAGING, INC., formerly MEAD-ATLANTA PAPER CO.: Methods of and apparatus for packaging articles in a wrapper blank.

842,477. A. S. JONSSON: Devices for the discharge of grain or similar small-sized material.

842,753. DIAMOND NATIONAL CORPORATION, formerly DIAMOND GARDNER CORPORATION: Packages or cartons for eggs and other fragile articles.

842,755. FAIRY FOOD PRODUCTS CO., LTD.: Processing of fish.

842,278. FLEXIBOX, LTD.: Mechanical seals.

842,817. H. M. EHLERT and I. MIKKELSEN: Process for treating oil-containing animal materials, such as fish and fish offal, to recover animal oil and to produce a foodstuff.

843,622. H. S. ROWTON, C. SHAW and R. ROBERTSON: Machines for filleting fish.

843,127. BRECKNELL, DOLMAN AND ROGERS, LTD.: Appliance for handling eggs and other objects, particularly of ovoidal or spherical form.

843,020. SOC. DES RAFFINERIES ET SUCRERIES SAY.: Centrifugal driers.

844,253. J. MALCHER and J. LAN: Production of starch and ethanol from starchy vegetable materials.

843,772. P. C. FORD: Instruments for use in removing egg shells or parts thereof.

843,687. FAIRBANKS, MORSE AND CO.: Apparatus for automatically controlling the weight of a batch of material.

844,451. UNILEVER, LTD.: Beverages.

843,955. BEACON PRODUCTION EQUIPMENT CORPORATION: Pallet unloading machines.

844,314. A. A. CLUBLEY: Process for the preparation of pickled eggs.

844,514. E. GRIFFITHS HUGHES, LTD.: Process for the production of a coffee extract in the form of a dry powder.

844,014. ROTO WRAP MACHINE CORPORATION: Packaging machine.

844,297. FOOD MACHINERY AND CHEMICAL CORPORATION: Horizontal reel type bean sizer.

New patents are from the Journal of Patents and new trade marks are from the Trade Marks Journal. In each case permission to publish has been given by the Controller of Her Majesty's Stationery Office. Each of the publications is obtainable from the Patents Office, 25, Southampton Buildings, London, W.C.2.

New Companies

Hetex (Birmingham), Ltd. (658114.) 265-75, Martins Bank Building, Water Street, Liverpool. To carry on bus. of heating, ventilating and refrigeration engineers, etc. £2,500. Dirs.: Richard H. Parker and George C. Fearnley.

Dennisons Bakery, Ltd. (658495.) City Flour Mills, King Street, Norwich. £100. Dirs.: L. Hector Read, Bryan C. Read and Stanley W. Sheldon.

Frozen Foods (London), Ltd. (658948.) Shaw Mill, Newbury, Berks. £50,000. Dirs.: Eustace H. Bonnett, Christopher R. Havergall, Theodore A. Raymond and Frederick G. Rayward.

C. W. Byford and Sons (Clare), Ltd. (658879.) To acquire the bus. cd. on by C. W. Byford and Sons, Ltd., at various addresses in Suffolk, Belchamp St. Paul, Essex; to carry on bus. of millers, flour, bran and breadstuff, meal, oil cake and other foodstuffs mnfrs., etc. £100. Subs.: Alfred H. Yallop and Geo. A. Saunders.

Great Dunmow Essence Company, Ltd. (654250.) 218-226, Kingsland Road, London, E.2. To carry on bus. of seed, pepper, spice and grain crushers, etc. £4,000. Dirs.: James F. Gray, Albert Franklin, Jeremy J. S. Gray, Allan J. Kemp and Jeremy J. Kemp.

L. Shardelow and Son, Ltd. (654270.) 18, Holton Road, Barry. To carry on bus. of wine, spirit and beer mchts., cider makers, brewers, etc. £1,000. Dirs.: Ronald Shardelow and Prudence I. Shardelow.

Fox's (Confectioners), Ltd. (654479.) 15, Park Road, Bingley, Yorkshire. To carry on bus. of bakers, etc. £10,000. Dirs.: Reginald M. Illingworth and Mrs. Joan F. Illingworth.

Fat Developments, Ltd. (655318.) 26-27, Conduit Street, London, W.1. To carry on bus. of importers, exporters, mnfrs. of and dlrs. in fats, food and food products, etc. £100. Dirs.: George Marx and Margaret I. Price.

Sinnett's Distributors, Ltd. (656586.) District Bank Buildings, Macclesfield. To carry on bus. of mnfrs. of and dlrs. in frozen and preserved foodstuffs, etc. £3,000. Dirs.: Norman B. Maurice, G. W. Murphy and John H. Harrison.

Hunt and Woolnough (St. Albans), Ltd. (657016.) Victoria House, 26, Victoria Street, Luton. To carry on bus. of mnfrs. of and dlrs. in chocolates, sweets, confectioneries, chewing gum, tea, coffee, etc. £5,000. Dirs.: Walter R. Woolnough and Alfred T. Hunt.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

Trade Marks

MEREDITH AND DREW.—787,880. Potato crisps. **Meredith and Drew, Ltd.**, Murray House, Barbican, London, E.C.1.

JAY.—790,213. Canned fruits, canned fish, canned meats, canned vegetables, canned milk and canned cream (edible). **Jay Products, Ltd.**, 22, Stowell Street, Newcastle-upon-Tyne.

RED ROSE.—791,567. Canned salmon. **British Columbia Packers, Ltd.**, Foot of Campbell Avenue, Vancouver, Province of British Columbia, Canada.

ORCHARD BLOSSOM.—794,405. Meat; fish and game, none being alive; meat extracts; jellies (for food), jams; dairy products (for food), edible oils, edible fats, pickles and fruit preserves and vegetable preserves. **S. Daniels and Co., Ltd.**, Oxford House, 15, Crosswall, London, E.C.3.

KRAUT-BOY. — 793,024. Sauerkraut, cabbages, brussels sprouts, and lettuces, all being dried, cooked, bottled or canned. **G. Kramer and Zonen N.V.**, Dorpstraat 121, Zuid-Scharwoude, Holland.

CHALET.—797,661. Meats, fish, fruits and vegetables, all being cooked, canned or preserved. **Anglo Union Food Industries (Pty.), Ltd.**, Suite 53, 5th Floor, Magor House, 74, Fox Street, Johannesburg, South Africa.

FEATHERLITE.—778,996. Self-raising flour made from wheat grown in the United Kingdom, for sale in the County of Staffordshire. **F. Garratt, Ltd.**, 12, Market Street, Lichfield, Staffordshire.

ESPRESSO.—780,650. Non-medicated sugar confectionery. **Hall Brothers (Whitefield), Ltd.**, The "State" Confectionery Works, Stanley Street, Whitefield, near Manchester.

EASTER EXPRESS.—782,659. Chocolates and non-medicated sugar confectionery. **O.P. Chocolate Specialities (Manufacturers), Ltd.**, Danyparc, Merthyr Tydfil, Glamorgan.

QUAKER VIGOUR.—782,896. Preparations consisting principally of cereals, chocolate, sugar and powdered milk, for use in making beverages. **Quaker Oats, Ltd.**, Bridge Road, Southall, Middlesex.

ROBINSON CRUSOE.—785,565. Non-medicated sugar confectionery being sweets. **Primrose Confectionery Company, Ltd.**, 15d, Argyll Avenue, Trading Estate, Slough, Buckinghamshire.

GOLDILOCKS.—785,567. Non-medicated sugar confectionery being sweets. **Primrose Confectionery Company, Ltd.**

MEREDITH AND DREW.—787,881. Biscuits (other than biscuits for animals) and flour confectionery. **Meredith and Drew, Ltd.**, Murray House, Barbican, London, E.C.1.

TREBOR BITTER-LEMON. — 789,554. Non-medicated sugar confectionery and

(*Continued overleaf*)

Trade Marks

Continued from previous page

chocolates, all being flavoured with lemon. **Robertson and Woodcock, Ltd.**, Trebor House, Woodford Green, Essex.

TREBOR BITTER-ORANGE.—789,555. Non-medicated sugar confectionery and chocolates, all being flavoured with orange. **Robertson and Woodcock, Ltd.**, Trebor House, Woodford Green, Essex.

V.G.—790,943. All goods included in Class 29. **Stewart, Ltd.**, 29, Tooley Street, London, S.E.1.

GULF BELLE. — 793,023. Canned shrimps. **Southland Canning and Packing Company**, 3201, Perdido Street, New Orleans, State of Louisiana, United States.

BA-LI-ETS.—794,514. Meat being fresh, frozen, preserved in cases or canned. **Aktieselskabet P. and S. Plum**, 26, St. Annae Plads, Copenhagen K, Denmark.

NAN.—796,607. All goods included in Class 29. **The Nestlé Company, Ltd.**, St. George's House, Wood Street, London, E.C.2.

VAN-DEL.—797,125. Fruit preserves, marmalade and jellies for food. **Productos Alimentor de Cuba S.A.**, Calle 60, No. 1102 Marianao, Havana, Cuba.

ROLD GOLD.—799,049. All goods included in Class 29. **Rold Gold Foods, Inc.**, 2445, South Wharf Street, St. Louis, State of Missouri, United States.

PRIMULA.—783,334. All goods included in Class 30, but not including rice, sago or tapioca or any goods of the same description as rice, sago or tapioca. **O. Kavli A/S**, Damsgardsveien 59, Bergen, Norway.

SWISS CREAMS.—789,231. Biscuits containing confectionery cream. **Chiltonian, Ltd.**, Manor Lane, Lee, London, S.E.12.

V.G.—790,944. All goods included in Class 30. **Stewart, Ltd.**, 29, Tooley Street, London, S.E.1.

SPANISHUZ.—B790,636. Non-medicated liquorice confectionery. **Gee Cross Laboratories, Ltd.**, Wilton Street, Denton, Manchester.

BLIX.—793,306. Non-medicated sugar confectionery. **M. A. Craven and Son, Ltd.**, French Almond Works, Coppergate, York.

SMEDLEY'S.—794,076. Meat pies, poultry pies, game pies and fruit pies, all being canned or preserved by freezing. **Smedley's, Ltd.**, Godstone Road, Whyteleafe, Surrey.

CHOCOLATE SUNCRISPS. — 795,529. Chocolate, chocolates, non-medicated chocolate confectionery and chocolate biscuits. **Cadbury Brothers, Ltd.**, Bournville, Birmingham.

CADBURY'S DRINKING CHOCOLATE. 795,558. Drinking chocolate. **Cadbury Brothers, Ltd.**, Bournville, Birmingham.

ST. JAMES PENNYMINTS.—795,660. Non-medicated mint-flavoured confectionery. **J. Harradine and Sons, Ltd.**, Preserve Works, St. James Road, London, S.E.1.

CHOCANILLA.—796,274. Preparations containing cocoa bean extract for flavouring and sweetening chocolate milk beverages, flour confections, ice cream and water ices, and for making chocolate sauces, chocolate custard and chocolate blancmange; chocolate sauces, chocolate-flavoured water ices. **Rayner and Company, Ltd.**, Commercial Road, London, N.18.

SUNBEAM.—796,454. Golden syrup. **Martineau's, Ltd.**, The Refinery, Kingward Street, London, E.1.

GREEN STAR.—778,223. All goods included in Class 29, but not including canned meats, canned fruits, canned vegetables or poultry, or any goods of the same description as any of these excluded goods. **H. and C. (Retail), Ltd.**, 179-189, City Road, London, E.C.1.

CREAM OF GOLD.—780,670. Butter for export to the Channel Islands. **Aplin and Barrett, Ltd.**, Newton Road, Yeovil, Somerset.

DIETALINE.—B787,900. Edible oils and edible fats. **Fabrique de Margarine MEA**, 10, rue de Lambusart, Fleurus, Belgium.

FRO-ZO.—B789,827. Vegetables and fruits, all being frozen. **Fro-zo Food Company Proprietary, Ltd.**, 17, Broadway, Oakleigh, State of Victoria, Commonwealth of Australia.

CLOVER COUNTY.—791,903. Poultry (none being live). **Cowling, Ltd.**, 283, Kirkgate Market, Leeds, 2, Yorkshire.

CHOCANILLA.—796,273. Milk beverages flavoured with chocolate, the milk predominating. **Rayner and Company, Ltd.**, Commercial Road, London, N.18.

SHARP'S GOLDEN LINE.—789,151. Toffees, chocolates; nougat (being a sweetmeat); and peppermints and boiled sweets, none being medicated. **Edward Sharp and Sons, Ltd.**, Kreemy Works, St. Peter Street, Maidstone, Kent.

ESKIMO.—793,436. All goods included in Class 30, but not including ice cream powders or chocolate, or any goods of the same description as any of these excluded goods. **Eskimo Foods, Ltd.**, East Side, Royal Dock, Grimsby, Lincolnshire.

TONIBELL.—B790,462. Ices; and wafers (biscuits). **Toni's Cream Ices, Ltd.**, Sinot House, Barnet Bye-Pass Road, Borehamwood, Hertfordshire.

JUJYFRUITS.—794,696. Candy, being non-medicated confectionery in the shape of fruits or fruit flavoured. **Henry Heide, Incorporated**, 313, Hudson Street, City, County and State of New York, United States of America.

GLOBAL GLOW.—795,965. Tea. **Global Exports, Ltd.**, 63, Lincoln's Inn Fields, London, W.C.2.

HILL-BILLY.—796,224. Biscuits (other than biscuits for animals). **John Hill and Son (1906), Ltd.**, Smith Street, Ashton-under-Lyne, Lancashire.

MALT-O-LUXE.—B793,307. Non-medicated sugar confectionery containing malt. **M. A. Craven and Son, Ltd.**, French Almond Works, Coppergate, York.

NUT-O-LUXE.—B793,308. Non-medicated sugar confectionery containing nuts. **M. A. Craven and Son, Ltd.**, French Almond Works, Coppergate, York.

MILLSTONE.—794,493. Self-raising flour and plain flour. **Palatine Packing Company, Ltd.**, Atlantic Mills, Droylesden Road, Newton Heath, Manchester, 10.

MAYCAFE.—B796,231. Coffee, essence of coffee, coffee extracts and mixtures of coffee and chicory. **Maypole Dairy Company, Ltd.**, 179-189, City Road, London, E.C.1.

CUBOX.—784,597. All goods included in Class 29. **Liebig's Extract of Meat Co., Ltd.**, Thames House, Queen Street Place, London, E.C.4.

SAUPIQUET.—790,392. All goods included in Class 29. **Société Anonyme des Etablissements Arsene Saupiquet**, 128, route de Paris, Nantes (Loire Atlantique), France.

PRODINTORG.—785,070. All goods included in Class 29. **Vsesojuznoje Exportno Importnoje Objedinenije Prodintorg**, Smolenskaja-Sanaja, 32-34, Moscow G200, Union of Socialist Soviet Republics.

GLOSTOMAT.—792,043. All goods included in Class 29. **Gloster Aircraft Company, Ltd.**, Gloucester.

ARBEN CROWN.—793,172. All goods included in Class 29. **Feltham and Franks, Ltd.**, 193, Coppermill Lane, Walthamstow, London, E.17.

ATECOSA.—795,749. All goods included in Class 29. **Ateco S.A.**, 7, Paseo de Marques de Monistrol, Madrid, Spain.

GROKO.—798,188. Preserved foodstuffs included in Class 29. **Conservenfabriek Kouwenberg Naamlooze Vennootschap**, Molenstraat 153, Zundert, Holland.

COLCOM. — 798,372. Canned meats. **Colcom Products Central Co-operative, Ltd.**, Stand 3191, Coventry Road, Salisbury, Southern Rhodesia.

ALSATIAN GOLD. — 795,778. Edible lard, being the produce of Alsace, France. **Stephen Istvan Szabo**, 167, Dorset House, Gloucester Place, London, N.W.1.

DANA.—B776,570. Rye bread. **The Danish Rye-bread Co., Ltd.**, 87, Wigmore Street, London, W.1.

RED STAR.—778,220. Biscuits (other than biscuits for animals), blancmange powder, bread, cakes, custard powder, golden syrup, honey, ice, meat pies, pepper, pastry, sugar and treacle. **H. and C. (Retail), Ltd.**, 179-189, City Road, London, E.C.1.

QUAKER LIFE.—782,445. All goods included in Class 30, but not including tea or any goods of the same description as tea. **Quaker Oats, Ltd.**, Bridge Road, Southall, Middlesex.

SNAPSTIX.—B786,340. Bread, biscuits (other than biscuits for animals) and cakes. **British Bakeries, Ltd.**, Millocrat House, Eastcheap, London, E.C.3.

BETTY CRACKER.—787,489. Cereal preparations for food for human consumption; flour; and mixes for cakes, pie-crusts, icings, pancakes, and for waffles. **General Mills, Inc.**, 9200, Wayzata Boulevard, City of Minneapolis, State of Minnesota, United States of America.

SHOWTIME.—797,660. Chocolate and non-medicated confectionery. **Meltis, Ltd.**, 158, Drummond Road, Bermondsey, London, S.E.16.

WARDOUR.—B797,391. Meats, fish, fruit and vegetables, all being tinned. **Polishon Produce Co., Ltd.**, 96, Wardour Street, London, W.1.

SEAMONARCH.—797,744. Fish (none being live). **Douglas Harvey Thompson** and **Walter Hemingway**, trading as **Douglas H. Thompson**, 1, Wharncliffe Road South, Fish Docks, Grimsby, Lincolnshire.

"KIN PAC."—798,768. Meat, poultry, game (none being live), and meat extracts, all pre-packed. **Charles Richard Whieldon, Charles William Whieldon** and **Jesse Whieldon**, trading as **C. R. Whieldon and Sons**, 17, Hazles Cross Road, Kingsley, Cheadle, Staffordshire.

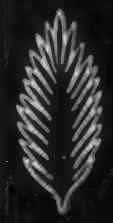
GOLDARD.—799,042. Edible oils and edible fats. **Mersey Casing and By-Products Company, Ltd.**, West Bank, Widnes, Lancashire.

TWILL.—799,204. Edible oils and edible fats. **J. Bibby and Sons, Ltd.**, 21, King Edward Street, Liverpool.

SACOVE.—789,558. All goods included in Class 29. **Concentrados Vegetales Sociedad Anonima**, Avenida Jose Antonio 27, Madrid, Spain.

Number 24 Aug. 1960

Specialised Products (No. 4)



LODERS and NUCOLINE LTD.

INFORMATION BULLETIN

This advertisement is one of a series of Information Bulletins issued by Loders & Nucoline Ltd. Copies are available, together with a folder, on request to Loders & Nucoline Ltd., Unilever House, London, E.C.4.

NUCOCOS

Description

Nucocos is a vegetable stearine butter which, in many applications, has numerous advantages over hydrogenated fats. It is completely tasteless and odourless and gives a pleasant creamy sensation to the palate. Nucocos is normally the colour of butter but can be supplied white if specially ordered.

Uses

In Biscuits. Nucocos is used by many biscuit manufacturers as a fat filling for laminated biscuits of the Butter Puff and Cream Cracker type. The advantages of this fat are that during dough braking it smears easily on compression by the rollers and does not break through the laminations of dough; nor does it oil into the flour. In consequence, the baked biscuit has a consistent volume and little tendency for the blisters on the surface to burst during packing.

In Sandwich Biscuit Fillings. Nucocos is extensively used in sweet and savoury cream fillings for sandwich-type biscuits. The cream has excellent eating qualities and the fat gives an excellent adhesion to the shells without excessive oiliness. Nucocos has a sufficiently high melting point to make it suitable for biscuit cream fillings for the home market during the summer.

In Sugar Confectionery. Nucocos is strongly recommended as a fat for toffees, caramels and fudges. Furthermore, extensive tests have shown that toffees and caramels made with Nucocos have improved creamy flavour and ideal eating properties, and also an exceptional resistance to sugar graining.

Pralines, soft centres and cream pastes for liquorice allsorts, etc., all benefit from the inclusion of Nucocos which greatly assists in the retention of moisture, thereby inhibiting drying over a long period of shelf life

Notes

We shall be pleased to arrange for our Technical Service Dept. to advise upon and demonstrate the uses of Nucocos.

TYPICAL PHYSICAL CONSTANTS

Iodine Value	14.5
Sap. Value	242
Setting Point	27.2°C.
Slip Point	32.5°C.
Complete Fusion	38.0°C.

LN 67 8058

PRECISION BS INSTRUMENTS

Announcing

THE NEW
ABBE 60 REFRACTOMETER

—so new that no illustration is yet available !

Below are given some of the salient features of this new, up-to-the-minute design:

HORIZONTAL FIXED PRISM—no more samples lost by running out of a tilting prism box.

TOTALLY ENCLOSED GLASS ARC—always clean and free from sticky finger marks.

SMOOTH CLEAN LINES—no crevices to trap dirt, easy to clean and keep clean.

BACK ILLUMINATION TO THE PRISM—for the examination of very dark or opaque samples.

Bellingham & Stanley Ltd.
DEPT. FM, 71 HORNSEY RISE, LONDON, N.19
PHONE: ARCHWAY 2270

METABISULPHITE OF POTASH

Effective Preservation for all kinds of Foods and Drinks
Maximum SO_2 Content

GRADED CRYSTALS, POWDER AND TABLET FORM

Write for samples, prices and analysis to:

F. KENDALL & SON LTD.
STRATFORD-ON-AVON

TELEPHONE: STRATFORD-ON-AVON 2031

FORK-LIFT TRUCKS FOR HIRE

W. C. YOUNGMAN LIMITED,
WANDSWORTH WORKS, WANDSWORTH ROAD, S.W.8.
Telephone: MACaulay 2233.

WILLIAM BRYAN LTD.

For Finest Quality

PEPPER & SPICES

MACE, NUTMEGS, GINGER, CINNAMON, ETC.

HERBS

KIBBLED ONIONS

VEGETABLE EXTRACT

ONION POWDER

Send your enquiries to:

3 LOVAT LANE
EASTCHEAP, LONDON, E.C.3

TELEPHONE NO.: MAN 1457. TELEGRAPHIC ADDRESS: VOLTZINE, BILGATE, LONDON

Here you can actually see how the 'Otter' scarifies impacted dirt and grease...

That's why so many firms call in B.V.C.

Solidified, impacted dirt and grease is quickly removed from every type of floor surface by the 'Otter' . . . it is the only *battery driven* floor scrubber that scarifies, scrubs or polishes. Ideal for vast expanses of heavy traffic floors in factories, kitchens, canteens—even on board ship. In its trail the 'Otter' leaves floors which are spotlessly clean.

Then there's the 'Musquash'—the most versatile member of the B.V.C. family. Where else do you find one and the same machine that can do all these jobs: shampoo carpets, wet-scrub, mop, dry-clean, light-sand and polish on *any* type of surface. It will even scrub or polish under fitments and furniture without clearing the room, and is silent in operation.

B.V.C.
FLOOR MAINTENANCE EQUIPMENT

The British Vacuum Cleaner & Engineering Co. Ltd.
Dept. FME/F.6, Goblin Works,
Leatherhead, Surrey. Telephone: Ashtead 866

One of the Goblin (B.V.C.) Group of Companies

CONSTANT RESEARCH

brings you

THE HIGHEST STANDARDS OF PURITY

THE MOST COMPETITIVE PRICES

A PRODUCT SUITABLE FOR ALL TYPES OF CONFECTIONERY

WITH

HODGSON'S Gelatine

RICHARD HODGSON & SONS LTD., BEVERLEY, YORKS. Tel. Beverley 81133

They see it's good

they see it's yours in a Spescopak

THEY won't take your word for it, they like to *see* what they are buying. They like to *see* your product is fresh – *see* it's clean – *see* its good quality. They can, when it's protected by a 'Spescopak'. What's more they are much more likely to *notice* it. The glossy surface of a 'Spescopak' catches their eye. Your brilliantly colour-printed design and brand name sparkle attractively. They can't resist handling your product in a 'Spescopak', and it won't matter if they do, because it won't tear or split.

Every 'Spescopak' is made from strong, flexible 'Visqueen' polythene film. It is moistureproof, chemically resistant, stays flexible in the deep freeze and cannot affect food in any way. In fact, a 'Spescopak' is the simplest and cheapest way to brand your product, protect it during transit and make it move off the shelf fast. It brings you new customers and brings them back for more.

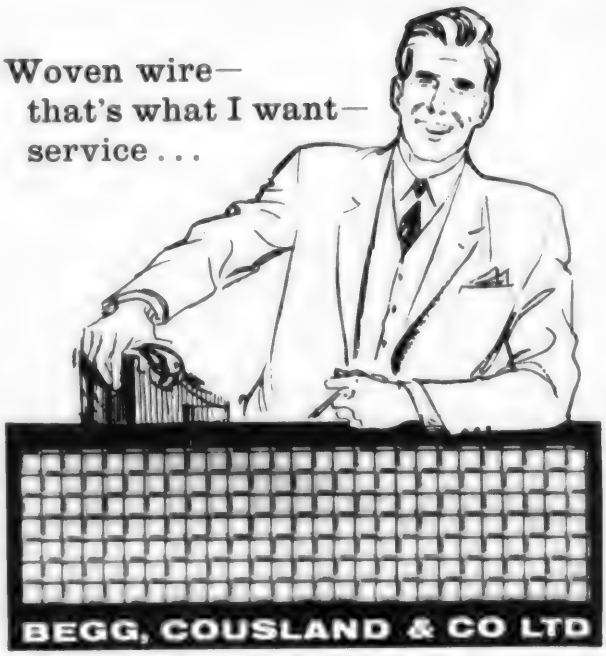
For profitable Food Packaging consult

Spesco

Spesco Developments Ltd. were in at the birth of polythene as a packaging material, and are now one of the largest converters in the U.K. In contacting Spesco, you are therefore tapping an unrivalled fund of experience and technical resources. Write now for samples and quotations to:

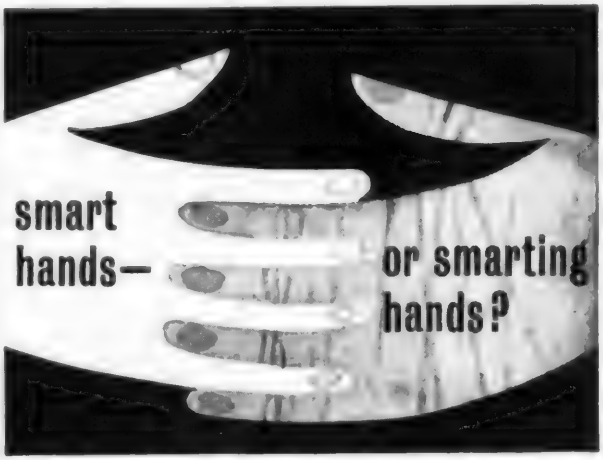
SPESCO DEVELOPMENTS LTD., HANWORTH LANE, CHERTSEY, SURREY.
TELEPHONE NO.—CHERTSEY 3411.

SP156 A



. . . and everything is arranged with Begg, Cousland—
where wire is woven in any mesh.
any metal for any purpose—
as perfect as a century of experience can make it.

SPRINGFIELD WIRE WORKS GLASGOW S.E.



Constant work with fruit juices, sugar and vegetables is hard on the hands but Rozalex Barrier Cream No. 10 offers a simple means of avoiding sore or smarting skin. Specially developed for bakers, confectioners and the food industries generally, it is water-resistant, contains no perfume and will not contaminate food in any way. Also available—Rozalex Fruit Stain Removing Cream. For literature and samples, please write to Rozalex Ltd, 10 Norfolk Street, Manchester 2.

ROZALEX
BARRIER CREAMS
protect

8133

Prime Quality Essential Oils

DEGA BRAND

HIGH QUALITY
terpeneless essential oils

- ANISEED CHINA STAR
- CLOVE ENGLISH AND FOREIGN
- ORANGE SWEET AND BITTER
- PEPPERMINT ARVENSIS AND PIPERITA
- TANGERINE SICILIAN
- LEMON SICILIAN

Sole U.K. distributors for **"FRATELLI CAMINITI" MESSINA for SICILIAN CITRUS ESSENTIAL OIL**

CHAS. ZIMMERMANN & CO. LTD. | DEGA WORKS, WALMGATE ROAD, PERIVALE, MIDDLESEX
telephone: PERivale 9121

LIVERPOOL
REGENT ROAD
BOOTLE 20
(*Bootle 4621 8*)

MANCHESTER
BARTON DOCK ROAD
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(*Urmston 2205*)

Inland and Continental

BULK HAULAGE
OF
LIQUIDS
AND
POWDERS

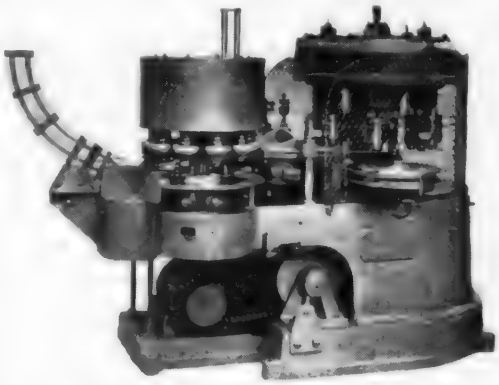
TANK AND HOPPER VEHICLES SUPPLIED ON CONTRACT HIRE

PICKFORDS

TANK HAULAGE SERVICE

MARSHGATE LANE, STRATFORD,
LONDON, E.15
(*Maryland 3064/7*)

HIGH SPEED CLOSING MACHINE



Fully-automatic, 4-head turret type double-seaming machine for closing round cans up to 250 a minute.

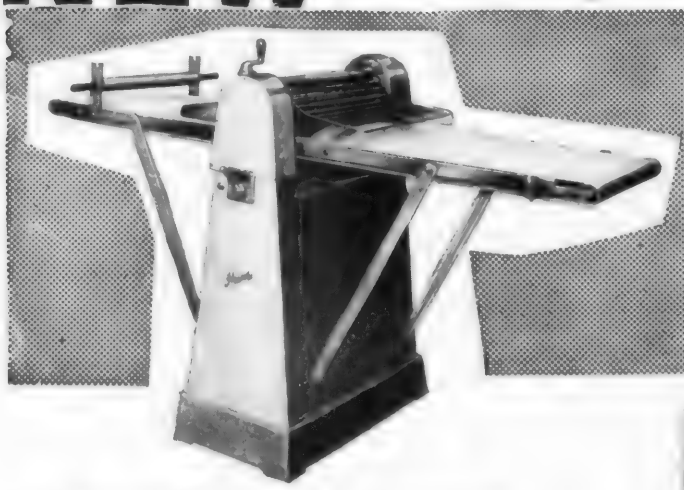
Can be supplied with 10-head liquid filler as shown in illustration. Steam glow attachment also available.

Write for details of this machine and of our vacuumising and closing machines, turntable soldering machines for tagger lids and gas charging boxes.

THE PREMIER FILTERPRESS CO. LTD
Dept. GN, Grosvenor Chambers
WALLINGTON · SURREY · ENGLAND

Telephone:	*Telegrams:*	*Cables:*
Wallington 5572/3	Filtering, Souphone, London.	Filtering, London.

NEW developments in



POWER PASTE ROLLING

by

HUNTS

of BOLTON

The design incorporates a conveyor belt principle enabling all types of paste to be handled at a speed greatly exceeding that of the fixed table type.

The necessity for handling the paste is avoided, as the paste is carried to and from the rollers by a conveyor belt. A special feature is the ease with which short pastry can be handled.

Please write for illustrated literature to:-

Table model 20 in. rollers . .	£275
Stand model 20 in. rollers . .	£315
Table model 24 in. rollers . .	£325
Stand mod l 24 in. rollers . .	£365

Attractive H.P. terms can be arranged.

JOHN HUNT (BOLTON) LTD

ALMA WORKS, RASBOTTOM STREET, BOLTON

Telephone: BOLTON 5831/2 Telegrams: HUNT 5831 BOLTON

600

STAINLESS STEEL VACUUM PLANT by Oscar Krenz, comprising Vacuum Pan, 48 in. by 8 ft. high with sight glass, manhole, vacuum gauge, tester, thermometer, pressure gauge, with Calandria, 48 in. diam. by 27 in. face to face with 192–2½ in. o.d. stainless steel tubes. Vacuum Pan with conical bottom with 3 in. outlet, connections, barometric condenser, etc.

HORIZONTAL VACUUM DRYING PLANT by Scott, comprising Horizontal Cylindrical Agitator Drier, 23 ft. long by 4 ft. i.d. with top centre feed inlet and bottom centre outlet with hand wheel control. Jacket pressure 10 p.s.i., chamber pressure 10 p.s.i., agitation gear tubular type shaft 10 p.s.i. steam pressure. Drive by 10 h.p. motor through worm reduction gearbox. Including steel feed hopper with dust hood and worm conveyor in bottom, electric vibration unit, vertical inclined steel enclosed belt and bucket elevator, overhead steel holding bin, etc.

VACUUM OVEN by Francis Shaw, mild steel welded construction, 5 ft. 2 in. wide by 8 ft. 9 in. long by 7 ft. high internally, heavy cast iron swing door each end having four corner wheel-operated swing clamps, sight glasses, lamps and aircocks. Top and bottom flanged connections to internal headers with swan neck connections to 17 steam heated platens of welded construction 1¼ in. thick, suitable 40 p.s.i. s.w.p. Daylight 3¾ in., effective platen width 60¾ in. THREE AVAILABLE.

VERTICAL TOTALLY ENCLOSED BLUE GLASS-LINED VESSEL by Pfaudler, approx. 200 gal. capacity, 3 ft. 6 in. diam. by 4 ft. deep, dished top with 18 in. manhole, dished bottom with centre outlet and side runoff. Sight glass and cocks fitted. FOUR AVAILABLE.

VERTICAL TOTALLY ENCLOSED STAINLESS STEEL PRESSURE VESSEL, 400 gal. capacity. Bolted flanged dished top, fitted one 2 in. diam. flanged inlet, three 1 in. flanged connections, one 2 in. centre bottom outlet, two sight glasses, one ¾ in. B.S.P. connection with draincock. Four angle support brackets welded to side. TWO AVAILABLE.

VERTICAL TOTALLY ENCLOSED JACKETED STAINLESS STEEL VESSEL by Metal Propellors, 100 gal. capacity, suitable 15 p.s.i. w.p., 2 ft. 6 in. diam. by 3 ft. on straight, dished bottom fitted 1½ in. diam. outlet connections, dished top fitted 24 in. diam. hinged quick release cover with 1½ in. centre inlet. TWO AVAILABLE.

HORIZONTAL POWDER MIXER by Gardner, 300 lb. capacity, size GG, mild steel trough 5 ft. by 18 in. by 23 in. deep with safety grill, hinged lid and bottom end slide outlet. Removable broken scroll agitator driven by 2 h.p. 400/440/3/50 cycles motor enclosed in end support pedestal with built in push button starter.

UNJACKETED STAINLESS STEEL LINED DOUBLE TROUGH MIXER by Baker Perkins, 600 lb. capacity, body mild steel construction, arranged for power tilting, fitted twin stainless steel ladder type blades, single geared and driven by 10 h.p. 400/3/50 cycles motor. Mixer fitted hinged steel lid with counterbalance weights, and mounted on cast iron bed.

DRUM BLENDER by W. R. Dell, size No. 2, mild steel drum 3 ft. diam. by 2 ft. long, mounted in mild steel angle frame and driven through spur gearing by 1 h.p. motor. Working capacity 9·3 cu. ft., batch type operation, dust tight and discharge valve emptying. Approx. 12 ft. screw type feed elevator with motor drive.

TWIN ROLL DRIER by Goudsche, fitted two steam heated rolls approx. 6 ft. 6 in. long by 2 ft. 4 in. diam., suitable 80 p.s.i. w.p., arranged for pulley drive through worm gearing and equipped with knife holders, knives, fume hood, discharge conveyor, etc.

TWIN ROLL BUFLOVAK DRIER by Consolidated Products of U.S.A., rolls 100 in. by 32 in., suitable 100 p.s.i. w.p. Driven through reduction gearing from 5 h.p. 400/3/50 cycles motor. Fitted adjustable scraper knives and aluminium hood. TWO AVAILABLE.

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General Manager for cannery in Hayes, Middlesex. Must have previous experience of administration and capable of dealing with all matters including staff and stock control. Salary by arrangement.—Tel.: MIN 1835.

STAFFORD Allen and Sons Ltd. have a vacancy for a keen and experienced Executive for an expanding department selling to the Manufacturing Food Industry. The position offers exceptionally good opportunity and responsibility. Applicants must have a sound knowledge of selling systems, campaigns, etc.—Write in confidence, giving full particulars, to the Managing Director, 20, Wharf Road, London, N.1.

WANTED, East Africa. Trained Chemist preferably with experience Food Industry. Live enquiring mind and interest in all aspects of development of progressive company. Attractive salary and responsibilities given to young man with ambition and flair for technical co-ordination.—Full details, references in strictest confidence to Box B. 5977, *Food Manufacture*, 9, Eden Street, N.W.1.

INTERNATIONAL Food Manufacturing Group require a Canning Assistant for their Nigerian Factory. Canning of Meat and allied products is carried out at this factory, which is comparatively small. A thorough knowledge of Closing Machines is essential, as is the ability to maintain ordinary factory equipment and services. A working knowledge of Production Methods would be an advantage.—Applicants should be 26-35 years of age and preferably single. Free housing provided. Two months' Home Leave every year with air passages paid. Pension Scheme. Starting salary £1,200 per annum. Write to Box E. 394 c/o Streets, 110, Old Broad Street, E.C.2.

MALE Quality Control Supervisor required. Must have experience in canning of fruit and vegetables. Thoroughly conversant with canning techniques.—Full details with salary range in confidence to: Works Director, Lockwoods Foods Ltd., Bridge Road, Long Sutton, Lincs.

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FOOD MANUFACTURE

MUST BE PREPAID

6d. a word, minimum 10s.

Box numbers, 2s. 6d. extra.

Replies to

BOX NUMBERS

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Food Manufacture, **Leonard Hill House, 9 Eden Street, London, N.W.1**

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PHILLIPS, SCOTT & TURNER, LTD.

manufacturers of Andrews Liver Salt, "Milk of Magnesia", Coldrex Tablets and other well-known preparations, invite applications for the following positions:

DEVELOPMENT CHEMISTS
FOOD TECHNOLOGISTS

The work will be concerned with a wide range of new products demanding original thought and ingenuity. Previous experience is very desirable.

Applications will be treated in strict confidence and should be sent to:

THE DEVELOPMENT MANAGER
PHILLIPS, SCOTT & TURNER, LTD.
Fawdon, Newcastle-upon-Tyne 3.

SITUATIONS VACANT

ESKIMO Foods Ltd. require Chemist for analytical control laboratory. Duties inclued implementation of routine analysis of prepared raw materials and investigations for product development. Experience of food analysis essential. Knowledge of packaging an advantage. H.N.C. Chemistry or similar qualifications an advantage.—Apply giving full details of age, qualifications and experience to Personnel Manager, Eskimo Foods Ltd., Pelham Road, Cleethorpes.

BEECHAM FOODS LIMITED

require a

LABORATORY TECHNICIAN

in their canning and confectionery factory at Lowestoft. Applicants should have obtained their O.N.C. (Chem.) or equivalent qualification, and preferably have experience in quality control of food products. Applicants will also be considered with higher qualifications including recently qualified graduates.

The Company operates a non-contributory Pension Fund and Profit Participation Scheme.

Applications giving full details of educational qualification should be addressed to the Personnel Manager, ref. L/T, Beecham House, Brentford, Middx.

MSL *have been retained to advise on the appointment of a*

ADMINISTRATION MANAGER

(Food Industry)

for an old established company in London engaged in meat products and catering. The company, which is quite small, requires an administrator who can take over control of all office and accounting duties in order to relieve the Managing Director to concentrate on development and expansion. He will work with the Managing Director in the general control of the company and will be responsible for introducing modern accounting and control procedures for this purpose.

Candidates, who should have an accountancy background preferably with qualifications, must have experience of modern control procedures and company administration. A knowledge of the meat and catering trade would be a strong recommendation.

Preferred age 28-35. The salary will be based on experience and ability and can be up to £2,000. There are good prospects of advancement which could lead to a directorship in the future.

Please send brief details, in confidence, quoting ref. AH.2535, to M. B. Berks. In no circumstances will a candidate's identity be disclosed to our client unless he gives permission after a confidential interview at which he will be given full details of the appointment.

MANAGEMENT SELECTION LIMITED, 17, Stratton Street, London, W.1

POSITIONS OF RESPONSIBILITY with INTERNATIONAL MEAT CANNING GROUP

(under British ownership)

ENGINEER

with wide experience in canning machinery. Must be fully conversant with M.B. seamers. Attractive commencing salary to applicant with qualifications to match this responsible situation.

GENERAL MANAGER

must be capable of controlling complete process for canned beefsteak and corned beef. Will operate direct to the Board of Directors. Applicant must have initiative enthusiasm and degree of mobility. Salary by negotiation.

Send details of age, qualifications and previous positions, to Collett, Dickenson, Pearce and Partners Limited, 125 High Holborn, London, W.C.1. Applications will be treated in the strictest confidence.

RESEARCH OFFICER

required by this independent and progressive Company. Applications are invited from technically qualified men with a wide practically knowledge of modern flour confectionery methods. This is a senior appointment which has become vacant due to internal promotion and carries a four figure salary. The selected candidate will be responsible for the Research and Development programme together with Quality Control of raw materials and finished products.

Apply in writing giving full details of age, experience, technical qualifications, present appointment and salary to the:

Managing Director,
Sayers (Confectioners) Limited,
Lorenzo Drive, Liverpool, 11.

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A special course in Advanced Microbiology, dealing with modern techniques, will begin on October 7th, 1960.

Tuition fees—40s.

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WANTED

FATS and Oils (vegetable), surplus, purchased by L. R. Stevens, "Stella Maris," Dirtham Lane, Effingham, Surrey. Tel.: East Horsley 3229.

WANTED: Votator, type GL.61A.—Box B5979, *Food Manufacture*, 9, Eden Street, N.W.1.

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"FRIGIDAIRE" Low Temperature Refrigerators, 49 in. w. by 28 in. d. by 34 in. h. ext Ex large National user, suitable A.C. or D.C. deep freezing, storage of ice cream, frozen foods, etc. Price £40 each. Domestic Refrigerators, Service Cabinets and Cold Rooms also available.—A.R.C., 134, Great Portland Street, London, W.1. Tel.: MUSeum 4480.

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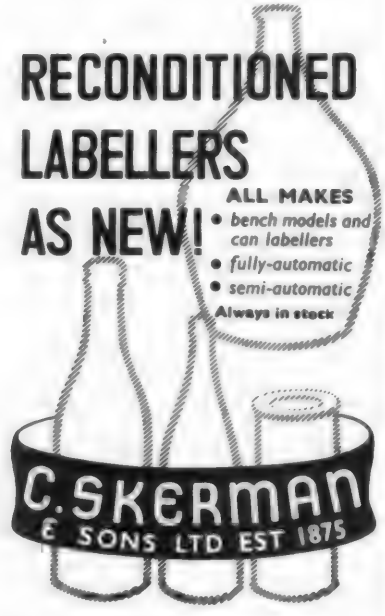

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BOOKS

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FOOD Poisoning. Elliot B. Dewberry, M.B.E., F.R.S.H., F.R.I.P.H. Food poisoning can kill. It is a danger that no food producer can afford to ignore. The slightest lack of care in the factory may have a result that is fatal not only to the consumer but to the business and reputation of the processor. An essential book in the control and diagnosis of food poisoning is E. B. Dewberry's *Food Poisoning*. This book is invaluable, not only to those connected with food preparation and handling, but to the medical profession and public health inspectors. Fourth edition. Demy 8vo. 45s. net.

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I.S.I.S. Appointments Register

Licensed annually by the L.C.C.

9, Eden Street, London, N.W.1. EUSton 5911.

I.S.I.S. is an organisation backed by a large industrial group of consultants with contacts in all the industries based on technology. As an addition to their present resources they have established this Appointments Register. Below will be found some of those technologists who are looking for further opportunities. Employers and Personnel Officers are invited to complete the form below, detach and send to the above address. In this particular instance the use of a form, with its attendant simplification of office systems, ensures speedier results for the employer.

Ref. A.601. British. Male. Married. Age 32. Dip. in English. F.Royal Economic Soc., M.Inst. Sociology. Experience includes 2 years Trainee Agent, politics, 10 years Supervisor for private educational organisation in economics, industry and current affairs responsible for organising lectures, courses in social and industrial studies. Seeks post in Industrial Administration or as Industrial Representative U.K. Salary £750-£800.

Ref. A.602. British. Male. Married. Age 38. 2 years studies in Time and Motion. Experience includes 2 years selling, 3 years pilot, R.A.F., 3 years Coal Sampler, N.C.B. At present engaged in Dust Suppression Investigations, coal mining. Will consider any suitable appointments, anywhere. Salary £850 p.a.

Ref. A.603. British. Male. Married. Age 50. 2 years Lab.Asst.Metallurgical research. 3 years Asst. Chemist, patent medicines. 4 years Tool Maker and 2 years Foreman (M/c shops and coilwinding), electrical engineers). 23 years Machine Shops Superintendent (including finishing shops), electrical engineers. Fully experienced all aspects of light engineering, including planning progress shop-loading—layout—work-study, control of male and female labour. Seeks post as Works Manager, or similar, London or S. or S.W. England. Salary £1,500 p.a. min.

Ref. A.604. British. Male. Married. Age 33. Inter. standard C. & G. M/C Shop Engineering. 4 years Apprentice Instrument Maker, electrical engineers. 5 years Instrument Maker (prototype), electrical instrument manufacturers. 1 year Engineer Foreman and 2 years Asst. Works Manager, manufacturers of tungsten carbide tools, dies, etc. At present Production Controller, manufacturers of electro-mech. instruments. Seeks post as Production Controller or Manager, U.K. Salary £1,250-£1,400 p.a.

Ref. A.605. British. Male. Married. Age 31. H.N.C. (Radio) and 6 certs. in telecommunications. 2 years Wireless Fitter/Instructor, R.A.F. 1 year i/c of Test, manufacturers of hearing aids. 2 years Development Engineer hearing aid manufacturers. 3 years Development Engineer, manufacturers of radio transmitters and receivers. 4 years Works Manager, tape recorder manufacturer. Seeks Senior Administrative appointment with radio or electronic company. London preferred, but anywhere considered. Salary £1,500 p.a. min.

Ref. A.606. British. Male. Married. Age 35. Post Office Certs. in Maintenance. 18 years Technician Class I, telecommunications. 9 months Representative, finance company. At present employed as Manufacturer's Agent. Seeks post as Representative, U.K. preferably S.E. England. Salary £800 p.a. min.

Ref. A.607. Indian. Male. Married. Age 29. B.Sc. with Chem., Botany and Zoo., M.Sc.(Botany). At present resident India and employed as Microbiologist i/c citric acid fermentation division of Indian organisation associated with American and Swiss pharmaceutical, fine chemicals and antibiotics manufacturers. Seeks appointment as Mycologist or Microbiologist London or Birmingham, £60-£80 per month.

Ref. A.608. British. Male. Married. Age 45. B.Sc. (Elect.Eng.). 4 years Development Engineer, radio equipment. 4½ years Signals Officer, R.A.F. 2 years Engineer i/c Test Gear, radio equipment manufacturer. 7 years Senior Scientific Officer, Government department. 1 year Consultant Engineer and Production Manager, electrical/chemical concern. 2 years Special Projects Engineer, manufacturer radio components and equipment. Seeks Technical Administration appointment. U.K., preferably London. Salary £2,000 p.a.

Ref. A.609. Indian. Male. Single. Age 24. Resident India. Nat. Cert. Mech.Engg. 5 months Apprentice Engineer, maintenance shop. 8 months, Assistant Engineer, manufacturer padlocks and hinges. At present Assistant Engineer, manufacturer coolers, air-conditioners and loudspeakers. Seeks post London or U.S.A. Salary £650 p.a.

Ref. A.610. British. Male. Married. Age 28. 1st Class Final C. & G., 1st Class Northern Counties in Bread and Flour Confectionery, M.Inst. British Bakers. 2 years Apprentice, bakery. 3½ years Baker and Confectioner, large plant bakery. 4½ years Foreman Confectioner, large plant bakery. At present Training Factory Superintendent, meat pie manufacturers. Seeks post U.K.—not London—as Assistant Bakery Manager Production Manager. Salary £1,200-£1,500 p.a.

Ref. A.611. British. Male. Married. Age 40. B.Sc., A.R.I.C., A.P.I. 2 years Section Leader, paint and varnish manufacturer. 1 year Chemist, chemical manufacturer. 5 years Chief Chemist, synthetic resin manufacturer. At present Works Manager, synthetic resin and chemical manufacturer. Seeks Administrative or Management appointment. London area preferred. Salary £1,500 p.a. min.

Ref. A.612. British. Male. Married. Age 51. L.A.D.E. 8 years Secretary and Display Manager, manufacturers typewriter ribbon and carbon. 2 years Mail Order Manager. 8 years Advertising Manager, printing works. 2 years Litho and Letterpress Manager, process workers. 5 years Director, advertising agency. 2 years Production and Marketing Manager, nameplate manufacturers. Experience in training outside staff, preparation and maintenance of statistical forms, process and commercial photography. Seeks Managerial appointment in London. Salary £2,000 p.a.

Ref. A.613. British. Male. Married. Age 51. 11 years Chief Planner, company manufacturing telephones. At present Production Controller, aero engines. Experience in control of male and female staff, ordering, scheduling, stock records, stores controls and layout, planning, purchasing, inwards goods, despatch, sales service and sub-contracts. Seeks post as Production Controller, London or S. England. Salary £1,500 p.a.

Ref. A.614. British. Male. Single. Age 37. O.N.C. Level and Marine Engg. Cert. 5 years Workshops training and Draughtsman, aircraft production. 3 years Draughtsman, aero engine production. 1 year Draughtsman, equipment manufacturer. 2 years Merchant Marine Service Engineer—diesel. At present Draughtsman, marine and transmission consultant engineers. Seeks post as Technical Representative, or similar. London or abroad. Salary £1,000 p.a. approx.

Ref. A.615. British. Male. Married. Age 32. O.N.C. Chem. & Mech., H.N.C. Chem. Eng., A.F.Inst.Pet. 3 years Laboratory Assistant, pharmaceutical company. 2 years Refinery Technician, oil company. 3 years Shift Manager, 2 years Production Executive and 1 year Asst. Works Manager, chemical manufacturer. Seeks post as Works Production Manager, N. London or N.W. Essex. Salary £1,350 p.a.

Ref. A.616. British. Male. Married. Age 36. 3½ years Wayleave Assistant, electricity supply undertaking. 2½ years Aircraft Detail Fitter, aircraft manufacturers. At present Buyer (light engg.), telecommunications and electronic equipment manufacturer. Seeks post as Technical Sales Representative, U.K. Salary £1,000 p.a. approx.

Ref. A.617. British. Male. Single. M.O.T. Radar Cert., Inter. C. & G. Telecommunications. 1 year Radio Officer, communications company. At present Seagoing Radio Officer, marine telecommunication company. Seeks technical post with radio or radar company. U.K., preferably Leeds area. Salary £520 p.a. approx.

(Continued overleaf

To: I.S.I.S. Appointments Register, 9, Eden Street, London, N.W.1. Please ask the following applicants to communicate with the undersigned:

Ref.:_____	**Ref.:**_____	**Ref.:**_____	**Ref.:**_____
Ref.:_____	**Ref.:**_____	**Ref.:**_____	**Ref.:**_____
Ref.:_____	**Ref.:**_____	**Ref.:**_____	**Ref.:**_____

Please use Block capitals

Name: _____

Position: _____

Company: _____

Business or Profession: _____

Address: _____

All introductions are made on the understanding that should an engagement result the employer agrees to I.S.I.S. Appointments Register's terms, which are as follows:

For each person engaged the equivalent of two weeks salary payable by the employer within fourteen days of the date of engagement.

Signature_____ Date_____

I.S.I.S. APPOINTMENTS REGISTER (*Continued from previous page*)

Ref. A.618. British. Male. Married. Age 50. Inter.Inst. of Bankers, Inter. Inst. of Cost and Works Accountants. 2 years Departmental Manager, mail order stores. 1 year Asst. Works Manager, pharmaceutical manufacturers. 10 years Asst. Factory Manager, pharmaceutical manufacturers. At present Administrative Assistant to Works Manager, pharmaceutical manufacturers. Seeks General or Personnel Management or Administration post, U.K. (Portsmouth area preferred). Salary £1,500-£1,750 p.a.

Ref. A.619. British. Male. Married. Age 27. H.N.C. Chem. 4 years Laboratory Assistant, industrial research. 7 months. Asst. Chemist, chemical manufacturer. 4 years Asst. Chemist, coal gas manufacturer. At present Asst. Chemist, synthetic rubber manufacturers. Seeks post as Chemist, Merseyside area. Salary £800 p.a.

Ref. A.620. Indian. Male. Married. Age 33. Dip. in Elec. and Mech. Engg., H.N.C.(Mech.), Grad. I.E.D. 4 years Technical Assistant, motor manufacturers. 1½ years Draughtsman/Engineer, chemical manufacturers. 3½ years Designer/Draughtsman, U.K. chemical engineering company. At present employed in India as Engineer i/c Drawing Office, manufacturers of chemicals and dye-stuffs. Seeks post as Draughtsman/Engineer, U.K., Germany or Denmark. Salary £900/£1,000 p.a.

Ref. A.621. British. Male. Married. Age 47. Inter. B.Sc., M.Nat.Inst.Engrs., M.Inst. of Metals. 3½ years Chief Planning Engineer, aircraft manufacturers. 7½ years Chief Engineer, general and structural engineers. 3 years Chief Draughtsman and 1½ years Group Development Engineer, manufacturers of aero and venilating equipment. 1 year Design Engineer, manufacturers fume exchange and ventilating equipment. 1 year Chief Draughtsman, manufacturers heat and ventilating equipment. At present Project Engineer, manufacturers and consultants, dust control equipment. Seeks post as Chief Draughtsman, Design Office Manager, or similar, London, Surrey, Bucks. or Berks. Salary £1,500 p.a.

Ref. A.622. Indian. Male. Single. Age 26. B.E. (Civil). At present resident India. 4 years R.C. Designer in company designing R.C. framed structures. Seeks post as R.C. Designer, U.K., preferably London. Salary £750 p.a. min.

Ref. A.623. British. Male. Married. Age 34. A.M.I.E., approved A.I.D. Inspector. 4 years Machine Tools Apprentice. 8 years i/c Army machine shop. At present Senior Inspector, precision engg., guided weapons, aircraft installations and equipment. Seeks post as Engineers' Representative, Home Counties. Salary £1,000 p.a.

Ref. A.624. British. Male. Married. Age 32. B.Met. 6 years Chief Chemist, rivet manufacturer (and rivet setting machines). At present Chief Chemist, manufacturer precision electro-mech components. Experience boiler house control, heat treatment, metal finishing, heavy deposition gold, silver, copper, polyester and epoxy resins and analysis. Seeks appointment as Chief Chemist, U.K., U.S.A., Canada, Australia. Salary £2,000 p.a.

Ref. A.625. Indian. Male. Single. Age 25. B.Sc. (Glasgow) (Mech. Engg., B.Sc. Pure Science. At present resident U.K. 6 months vacational training manufacturer of radiators and coolers, and 6 months, manufacturer of machine tools and grinding machines. At present Draughtsman, manufacturer of excavators. Seeks engineering appointment, India or London.

Ref. A.626. British. Male. Married. Age 52. A.M.I.E., M.I.S.T. 5 years Spare Fitter and 3½ years Construction Fitter, boiler manufacturers. 2½ years Plant Maintenance Engineer, building plant. 6 years Charge Hand Fitter, aircraft engineers. 3½ years Maintenance Fitter, boiler manufacturers. 4½ years Maintenance Engineer, copper tube factory. At present Laboratory and Workshop Steward. Seeks post as Maintenance Engineer or Laboratory/Workshop Steward. Salary £720 p.a.

Ref. A.627. British. Male. Married. Age 29. C. & G. Printing Ink Technology, O.N.C. Std.Chem. 7 years i/c control Laboratory together with development work on new high speed photogravure process inks, printing ink manufacture. At present Printing Adviser, laminated plastics film manufacturer. Familiar with formulation of inks for all processes, provision of technical service to customers and direction and control of staff and labour. Seeks post as Printing (Ink) Technologist with printers or ink manufacturers. London. Salary £1,500 p.a.

Ref. A.628. British. Male. Married. Age 28. H.N.C. Instrument Engg. 3½ years Draughtsman, instruments. 1½ years Senior Design Draughtsman, instruments and automation. At present Senior Design Draughtsman, industrial instrument manufacturers. Seeks post as Asst. Instrument Engineer, London. Salary £1,100 p.a.

Ref. A.629. Indian. Male. Single. Age 24. Dip. Mech.Engg. Resident India. 1½ years Apprentice and then Engineer Draughtsman, designing, fabrication and erection of chemical plants. Seeks post as Engineer/Draughtsman, U.K., U.S.A. or Canada. Salary £700-£800 p.a.

Ref. A.630. Indian. Male. Single. Age 28. Resident India. M.Sc. Organic Chem. 1 year Laboratory Chemist, 6 months Development Chemist, 1 year Plant Chemist, 1 year Technical Trainee and 4 years Shift Superintendent, manufacture soaps, toilet preparations and glycerine. Seeks post as Works Superintendent or Chemist in Soap, Detergent or Organic Chemicals manufacturing industries. U.K., U.S.A., Canada or West Germany. Salary £1,500 p.a.

Ref. A.631. British. Male. Single. Age 30. B.Sc. (Chem., Physics, Maths.), Parts I and II, Exam. of Inst.Chem.Engrs. 9 months Research Chemical Engineer, soap and heavy chemicals (silicates). 2½ years Assistant in Plant Investigation Dept., zinc pigments, zinc and barium chemicals. 3 years Development Chemist, gas meters, appliances and instruments. At present Research Metallugrist, research on ore dressing and processes and operations for copper mining companies. Seeks post as Chemical Process Engineer or Design Engineer (Chemical). U.K. Salary £1,400 p.a.

Ref. A.632. British. Male. Married. Age 26. O.N.C. Chem., H.N.C. Chem.Engg., Grad.I.Chem.E. 3 years Laboratory Assistant, seed crushers. 2 years Research Assistant, rayon manufacturers. 3 years Chemical Engineer, synthetic resin manufacturers. At present Works Engineer, chemical manufacturers. Seeks post as Chemical Engineer, U.K.—not London. Salary £1,000 p.a. min.

Ref. A.633. Indian. Male. Married. Age 29. B.E.(Civil), B.Sc.(Physics, Chem., Maths.). Resident India and employed as Asst. Engineer in civil engineering department, architectural and structural designs for public buildings throughout India and construction. Seeks post as Designer or Research Assistant, London area or U.S.A. Salary £800 p.a.

Ref. A.634. British. Male. Single. Age 26. 6 years Draughtsman, roofing engineers. 1 year Draughtsman and 3 years Draughtsman and Checker, Canadian structural engineers. At present Structural Engineering Draughtsman, structural engineers. Thorough knowledge all aspects roofing engineering. Seeks post as Technical Representative (building industry), U.K. Salary £800 p.a.

Ref. A.635. British. Male. Married. O.N.C. 6 years. Apprentice, electrical engineers. 7 years, Maintenance Engineer, drug manufacturers. At present Power Engineer engaged in estimating and design of stand-by power plant, telephone manufacturers. Experience electrical contracting work. Seeks post as Technical Representative, U.K. £1,000-£1,200 p.a.

Ref. A.636. British. Male. Married. Age 26. H.N.C. Mech., G.I.Mech.Engrs. 5 years Apprentice Draughtsman, 1 year Junior Draughtsman and 4 months Colliery Draughtsman, coal mining. At present Asst. Mechanical Engineer, coal mining. Seeks mechanical engineering appointment, U.K. Salary £925 p.a.

Ref. A.637. British. Male. Single. Age 41. Dip. Business Organisation and Methods, Dip. Commercial Engineering and Works Management, A.M.I.W.M., A.M.I.Prod.E., F.Inst.D. 7 years Apprenticeship to Planning and Time Study Engineer, electrical engineers. 3 years Inspector-in-Charge, aircraft manufacturers. 2 years Asst. to Residential Consultant, agricultural implement manufacturers. 2 years Work Study Officer, steel manufacturers. 4 years Asst. Director, textile manufacturers. 4 years Director of management consultancy company. Seeks part/full-time Special Advisory Directorship, Asst. Directorship or P.A. to Managing Director, or post leading to part/full-time directorship, N. Wales Cheshire, Lancs.

Ref. A.638. Indian. Male. Single. Age 22. Resident India. 2½ years Draughtsman (mechanical), company manufacturing diesel engine parts for Indian branch of British company. Seeks post as Draughtsman (mechanical), London or India.

Ref. A.639. Dutch. Male. Married. Age 32. Resident U.K. Degree in Mech.Engg. 4 years Asst. Technical Officer (design of chemical plant), chemical manufacturers. 5½ years Area Drilling Superintendent and Engineer i/c Maintenance Dept., producers and refiners of crude oil. Seeks post as Engineer or Technical Representative, preferably in oilfield equipment, or post in oilwell drilling industry, or as Manager of overseas contracts for contractor. Will consider any area. Salary in U.K. £1,500 p.a.

Ref. A.640. British. Male. Married. Age 70. A.M.Inst.C.E., A.M.I.M.E. 6 years Asst. Engineer, consulting civil engineers. 18 years Engineering Assistant, railways. 1 year Stressman—Special Test Rig. Designer, aircraft manufacturer. 1 year Designer, constructional steelwork manufacturers. 3 years Production Engineer, government work. 4 years Resident New Works Engineer, railways. At present Civil Engineer, consulting civil engineers. Seeks appointment as Traffic Engineer, London. Salary £1,500 p.a.

Ref. A.641. Irish. Male. Married. Age 61. B.A., B.A.I., A.M.I.C.E., F.I.W.I. 28 years Asst. Engineer to Deputy C.E. (Maintenance), railways, India. 4½ years Civil Engineer and Resident Engineer, air ministry works directorate. 2 years General Manager, structural engineers. 8 months District Engineer, railways, Nigeria. 9 months Technical Appointment with Ministry of Transport, Nigeria. Seeks post as Supervisor of Control work/Site Engineer, U.K. or abroad. Salary £1,000 p.a.

Ref. A.642. British. Male. Married. Age 39. B.Sc.(Spec.Chem.). 6 years Exper. Asst., government dept. 1½ years Works Analyst, chemical manufacturers. 2 years Technical Officer, government dept. 7 years Senior Assistant, chemical manufacturers. At present Deputy Chief Analyst, chemical manufacturers. Seeks post as Chief Analyst, N. or E. London, Essex or Suffolk. Salary £1,500-£2,000 p.a.

Ref. A.642. British. Male. Single. Age 27. 10 years Electrician/Electrical Mechanic/Leading Electrical Mechanic, Royal Navy. At present Maintenance Engineer, background music company. Experience of A.C. and D.C. machinery, navigation aids and electronics. Seeks post as Electrical Technician, London. Salary £14-£16 p.w.

Ref. A.644. British. Male. Married. Age 38. Course in diesel engines. 8 years Driller, drilling oil wells. 1 year Driller, drilling water wells. 1 year Supervisor, drilling seismic holes. 4 years Driller, contract drilling oil wells. At present Driller/Materials Organiser, company producing refining and marketing petroleum. Seeks post as Materials Engineer anywhere, but preferably London office of oil or drilling company where experience in field conditions and drilling would be used.

Ref. A.645. British. Male. Married. Age 31. O.N.C.(Prod.). 5 years Apprentice and 1 year Planning Engineer, telecommunications engineers. 2 years Estimator, 3 years Planner and 4 years Time Study Engineer, electric meter manufacturers. At present Time Study Engineer, manufacturer of electric fans. Seeks post as Time Study or Work Study Engineer, N. London, N. Middlesex or Herts. Salary £950 p.a.

Ref. A.646. British. Male. Married. Age 41. H.N.C. Elect.Eng., C. & G. Final Radio Comm. 4 years Apprentice Student, radio and television electrical products. 4 years Junior Engineer in standards division and 2 years in drawing office, test equipment development. 6 months Engineer, radio and television. 6 months Engineer, electronic test equipment. 14 years Engineer, electronic equipment manufacture. At present Senior Project Engineer (electronic test equipment), manufacturers electronic equipment. Seeks post as Chief Inspector or similar executive appointment. U.K. Salary £1,500-£1,800 p.a.

Ref. A.600. British. Male. Married. Age 27. B.A. 4 years engaged in Production Planning and Material Control with present employers who are pharmaceutical manufacturers. Will consider any post offering responsibility and prospects. London or Provinces. Salary £1,200 p.a. min.

Ref. A.599. Indian. Male. Single. Age 24. At present resident India. B.Sc. Some months training in U.K. factory in chemical process. 6 months Trainee Foreman, manufacturer of air-conditioning plants. At present Foreman in factory manufacturing commercial blasting explosives. Seeks post in Chemical industry, London or W. Germany. Salary £60-£70 per month.

Ref. A.598. British. Male. Married. Age 27. 3 years Fitter, aircraft engineers. 1 year Fitter, motor engineers. 2 years Fitter, R.A.F. At present Sales Representative, duplicating machine manufacturers. Seeks post as Sales Representative, will move to any part of the U.K. for the right post. £12 p.w. plus commission.

Ref. A.597. British. Male. Married. Age 45. Assoc.M.Inst. of Work Study. 6 years Assistant Works Manager and 9 years Production Director, soap manufacturers. 3 years Administration and Financial Controller of big building project, pharmaceutical manufacturers. 2 years Work Study Officer, pharmaceutical manufacturers. Seeks post as Works Manager or Production Director with independent small or medium size manufacturing company. Central or S.E. London, N.W. Kent or N. Surrey preferred, but would consider any Southern counties. Salary £1,500 p.a. if good prospects exist.

Ref. A.596. British. Male. Married. Age 43. O.N.C., H.N.C., A.M.I.E.E. 6½ years R.A.F. Radar Tech. Officer. 4 years Development Engineer, electronic engineers. 2 years Radar Engineer and Instructor, Middle East Government. 4 years Development Engineer and 2 years Technical Sales, manufacturers of radar and electronic equipment. At present Electronic Engineer—development and technical sales—with manufacturer of electronic equipment and instruments. Seeks post as Senior Executive/Manager, London area. Salary £1,750 p.a. min.

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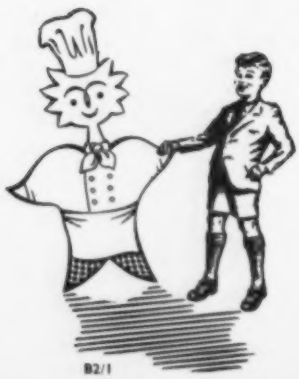

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